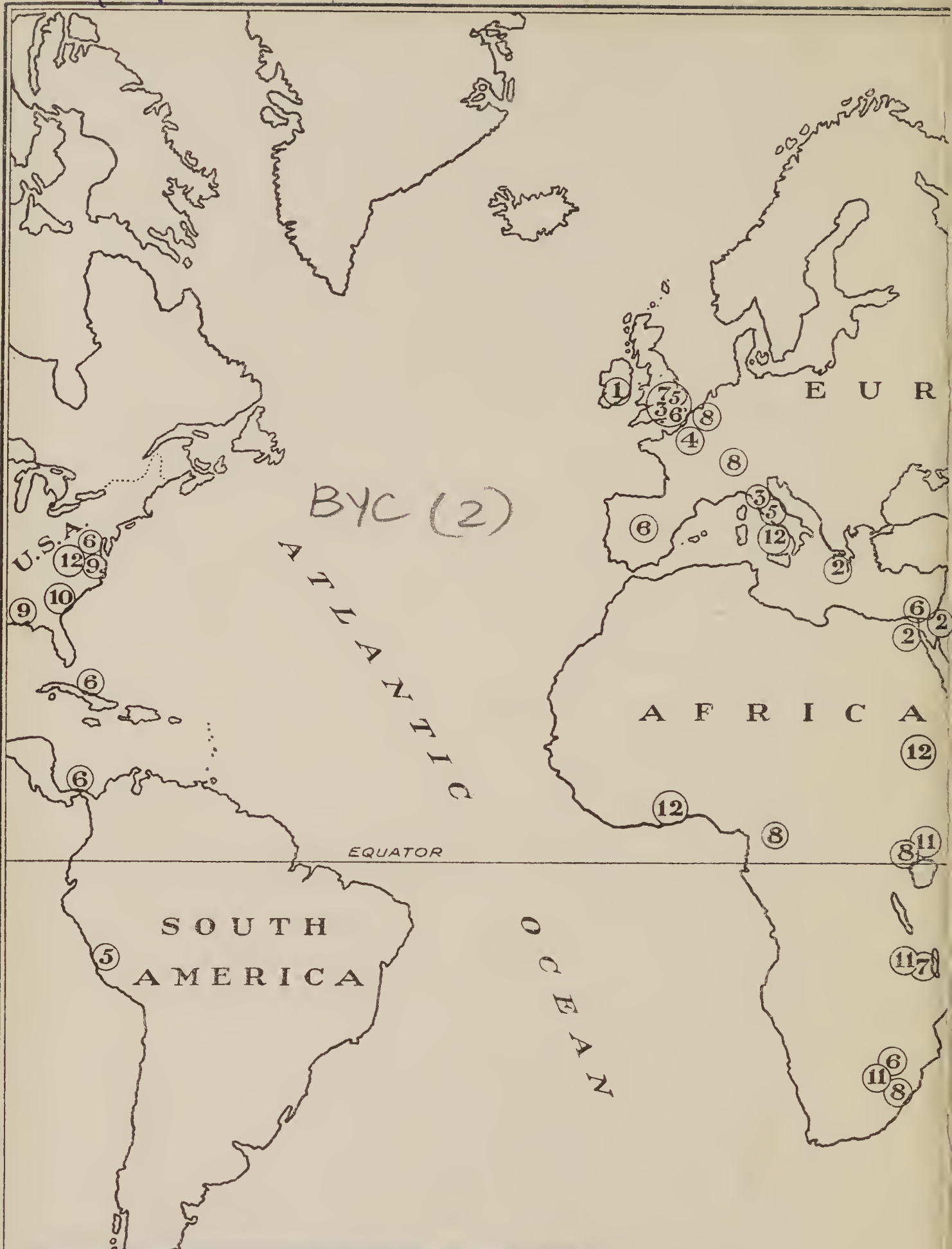
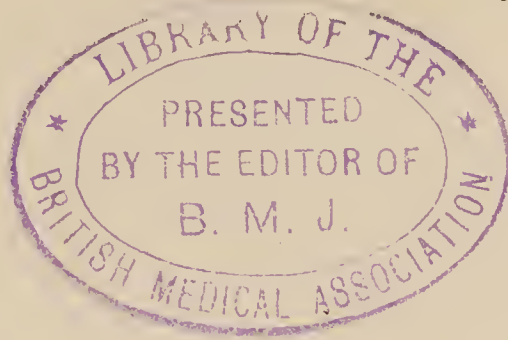


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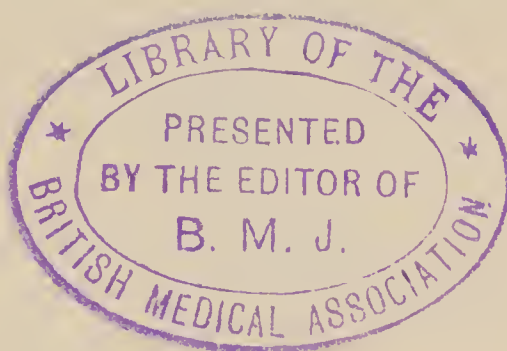
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HEROES OF HEALTH

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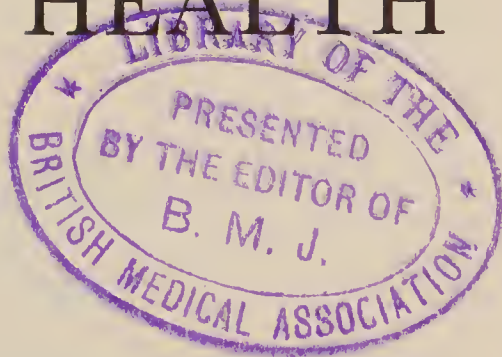
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HEROES OF HEALTH



BY

G. A. GOLLOCK

AUTHOR OF "LIVES OF EMINENT AFRICANS," "SONS OF AFRICA," "AT THE SIGN OF THE FLYING ANGEL," ETC.

WITH FOREWORD BY

SIR ANDREW BALFOUR

K.C.M.G., C.B., M.D.

DIRECTOR OF THE LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

WITH ILLUSTRATIONS AND 2 MAPS

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TO

THE SONS AND DAUGHTERS OF AFRICA
WHO HAVE HELPED TO MAKE
THIS BOOK
AND TO THOSE WHO THROUGH ITS
PAGES MAY LEARN TO SERVE
THEIR COUNTRY AS HEROES
OF HEALTH

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FOREWORD

MILTON, writing to Cromwell, asserted that "Peace hath her victories, no less renowned than war," and if there are any disposed to deny the truth of this statement they may with advantage turn to the pages of Miss Gollock's latest book.

It is true that the author is writing for a special audience, for young Africans just leaving school, and accordingly her "Heroes of Health" are carefully selected from a great number to whom that term aptly applies. Yet the general reader will find much to interest and instruct him. Perhaps at a later date Miss Gollock may deal with Heroines of Health, for these have not been lacking, as witness Florence Nightingale and Mary Kingsley. Indeed, in her text we come across some humble heroines, but, for the most part, she deals, like Carlyle, with heroes, and in the main with those whose work has been concerned more or less directly with Africa, or will specially appeal to Africans. True the great Pasteur fittingly finds a place, for a fine sermon on science and service can be preached from his life-labours, and Miss Gollock does not neglect the opportunity.

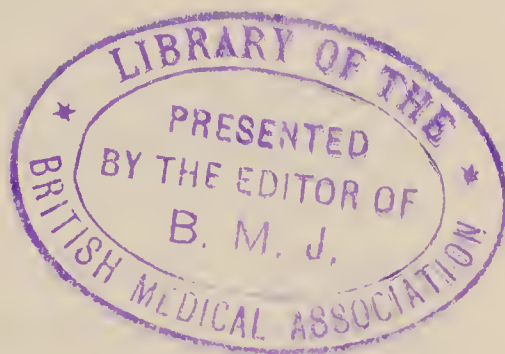
FOREWORD

Here and in some other sections she follows a well-trodden path, as when she deals with Moses and Hippocrates, Manson and Ross, with Sir David Bruce, and with Reed and Gorgas. On the other hand, one does not usually find St. Francis of Assisi in such company, and yet his work for the lepers surely entitles him to his place, while any surprise which may be felt at the inclusion of Booker Washington, his colleagues and disciples, will disappear when acquaintance is made with their aims and activities.

Throughout, Miss Gollock writes easily, accurately, within the limits she has set herself, and in an interesting manner which arrests the attention of the reader, and is doubtless well adapted to the audience for which she caters. Her book breathes the missionary spirit, and it should be helpful to many in the mission field and elsewhere.

The final chapter dealing with Home as the Stronghold of Health is especially to be commended, and the book, as a whole, is an earnest and worthy endeavour by a skilled writer to instruct the young African mind in health problems and to make it realize the importance of hygiene, the value of western science and the nobility of self-sacrifice.

ANDREW BALFOUR.



AUTHOR'S PREFACE

THE plan of this book took shape during Dr. Aggrey's final visit to England. Memories of the light on his eager face, the movements of his expressive hands, as we sketched the chapters and defined the aim, are still before me. The choice of material has been largely governed by two points which he made; one, that stories, always quite true, were the best means of arousing in young Africans a vital interest in Health; the other, that the stories must be drawn from many lands. "Africans," he said with a flash of humour, "do not like their country to be looked on as the only hotbed of disease."

Like its companion volume, *Lives of Eminent Africans*, these inspiring stories of Heroes of Health are written for young Africans who have passed through their school standards and are stepping out into life. Some will settle on the land, or make their way to the cities, or take up industrial work. Many will teach in schools, and find in these pages vivid illustrations for their lessons in hygiene. Others will go on to seek a degree in Africa or elsewhere in preparation for

AUTHOR'S PREFACE

entering one of the professions. All, or almost all, will soon marry and have homes of their own.

Their intelligent health service may be the centre of a circle of influence expanding to the confines of the race. It is a great calling, enough to quicken the pulses of those sprung from warrior tribes.

A glance at the Table of Contents will show the scope and limitations of this book. The opening chapter unfolds the purpose which underlies it all. Some of the greatest health workers and many of the sternest battles have found no mention for lack of space. A wealth of further stories waits to be told.

Those who have furthered the preparation of the book fall into two groups, one British, one American.

On the British side, the chapters in manuscript or in proof have been read by the Rev. E. W. Smith, author of *The Golden Stool* and other books with intimate knowledge of African life and thought ; by Dr. John A. Hayward and his wife, with special reference to medical and scientific accuracy ; by Mr. R. R. Young and his wife, both experienced teachers in Sierra Leone ; by Dr. Agnes Fraser, late of Nyasaland, who for years instructed Africans in matters of health ; and by Dr. Mary Blacklock, whose admirable text-books on Hygiene are widely used in the African continent. Sir Ronald Ross has kindly read Chapter 5. Suggestions from these and

AUTHOR'S PREFACE

several other readers have been welcomed, though responsibility for the final contents rests with the author alone.

At the outset, Sir Andrew Balfour, Director of the London School of Hygiene and Tropical Medicine, with wonted generosity gave all the weight of his distinguished knowledge and ready sympathy to the plans for the book. He has kindly revised the proofs before writing his foreword.

On the American side, the Phelps-Stokes Fund, at the hands of Canon A. Phelps Stokes and Dr. T. Jesse Jones, made it possible to set aside time for unhurried study of the subject. Further, in conjunction with Mr. George Foster Peabody, they arranged for the author a three months' visit to the United States. This gave opportunity for the collection of material for Chapters 9 and 10, and also opened up access to the records of health work in government departments, in universities, and in the offices of philanthropic and scientific agencies in Washington, New York and elsewhere. The memory of the generous interest of leading officials has been a constant inspiration. Seldom has so large a stream of international courtesy enriched so small a book.

But the deepest stimulus in the writing of the book has come from Africans themselves ; Dr. Aggrey's plea at the beginning has been repeated again and again. A few weeks ago, at tea in a

AUTHOR'S PREFACE

London restaurant, two Zulu guests on their way back to serve their own people in South Africa asked eagerly when the book would be ready for use. As a test, two or three of the stories from its pages were briefly told. The Africans listened spell-bound. "Tell those stories to our people ; they need them," said one. "They do," said the other, in grave assent.

Not for Zulus only, but for young Africans of every tribe and race, the stories are here told.

G. A. GOLLOCK.

LONDON,
November, 1930.

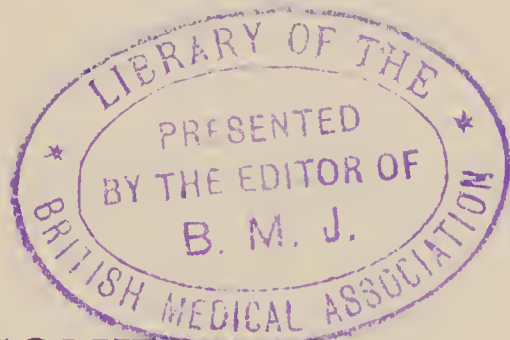


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*Map of Equatorial Africa showing where Sleeping Sickness occurs.

* By courtesy of the Health Section of the Secretariat of the League of Nations.



HEROES OF HEALTH

CHAPTER 1

WHY THIS BOOK WAS WRITTEN

I

My home was in a white house on a hillside in the south of Ireland. I grew up among gardens and cattle. There was land to be cultivated and seed to be sown. Birds had to be scared from the ripening corn. Roots had to be dug up, fruit had to be gathered in. There were chickens of every age, from the little yellow balls just hatched up to the solemn hens and the proud old cock of the farm. There were sheep with their lambs, cows with their calves, pigs with large and lively families, dogs with puppies, cats with kittens. There was also one wise old goat with no wife and no kids. In the white house there were a father and a mother, and three children whom they had brought into the world.

The wild creatures in the woods all had their young ; so had the rats and the mice. The birds laid eggs and hatched young ones, who were soon

HEROES OF HEALTH

the parents of new bird families. In the gardens seeds grew into plants, and these ripened fresh seed to be sown again. The living things on the farm seemed to grow up, grow old, and then live again in their young. It was like a great wheel of life turning round and round.

In summer-time the bees went from flower to flower in search of honey. Their hairy bodies carried the living dust from the heart of the male flower—the father—to the heart of the female flower—the mother. This caused the seed in the female flower to swell and ripen until at last it burst out ready to be sown. Sometimes the life-dust of the blossoms—called pollen—was blown from one flowering tree to another ; sometimes ripe seed—white and feathery—was carried by the breeze till it settled on the ground, died, and sprang to new life.

As we got older troubles came upon the owner of the white house. He kept his own fields clean, but his neighbours' fields had many weeds ; their seeds were blown across into the fertile fields, and took root among the corn. The cattle at the white house were well fed and gave rich milk, their little calves were strong. The pigs were clean and fat and sold well in the market. The chickens had a clean house, clean water and proper food, so they laid plenty of eggs. The new chickens year by year were big and strong. But there were farms not far off where the cattle were ill-cared for, lean and sickly, and where

WHY THIS BOOK WAS WRITTEN

chickens grew smaller and eggs fewer year by year. Disease laid hold of these poor neglected creatures. Infection was carried, like seeds by the wind, to the well-fed cattle on our farm. They too got ill and sometimes died. Once there was a terrible famine in the country so that food was lacking for man and beast. Sometimes no rain fell ; through long, hot, weary weeks the ground grew parched and dry. Sometimes floods came and washed the crops out of the ground. The owner of the white house knew what it meant to have all his labour lost.

Life on that farm was like a bit of the beautiful old story with which the Bible begins. There, as a man can tell the history of his tribe in one hour by the camp fire, the long, long record of the making of the world comes into a short and simple tale. The plants and trees seem to grow up before our eyes, the animals pass to and fro with their young. At last comes Man, given dominion over all, bidden to stock the earth.

Then the scene changes, as when a shadow falls across the sun. Disobedience has brought sin, disease and death into the world. Thorns and briars spring up. The bush closes in. The animals begin to devour one another. Work means heavy toil and sweat. Man starts out to fight in the battle between life and death. But already there is heard as in a whisper the promise of victory in the end.

HEROES OF HEALTH

II

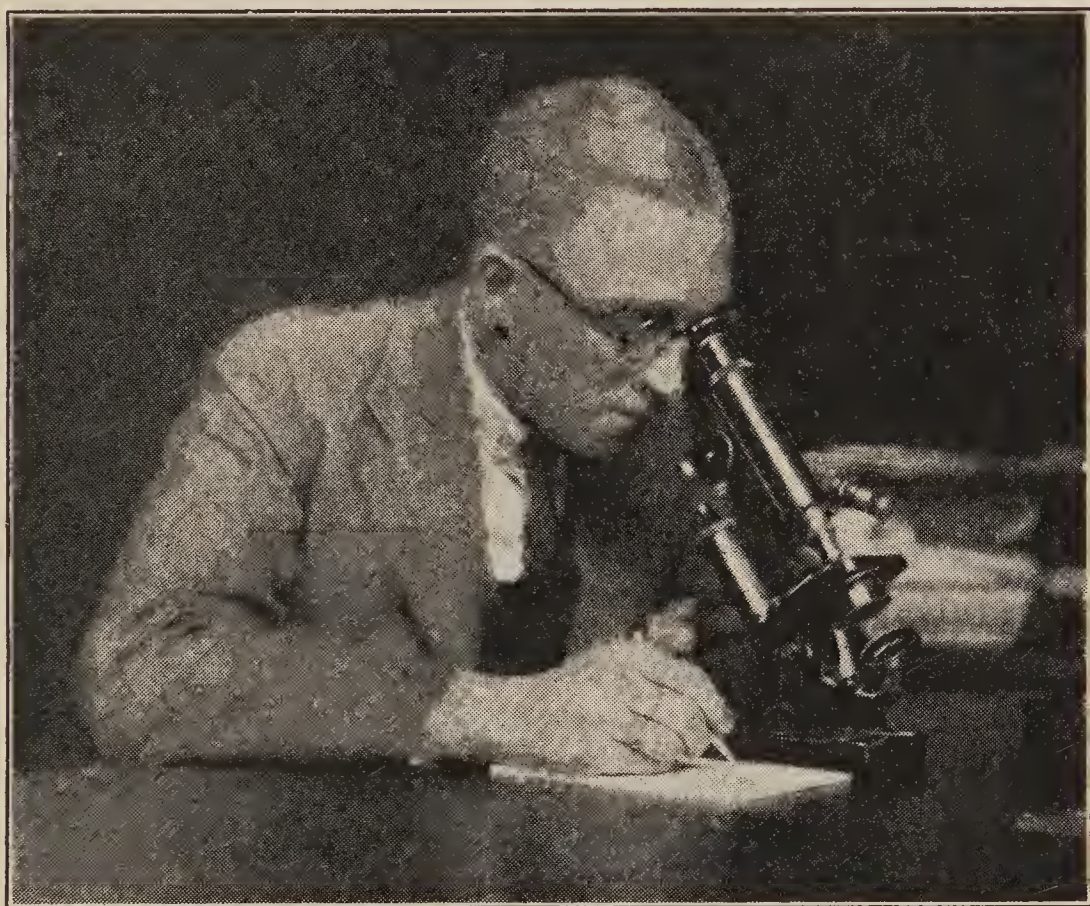
We left the country and came to live in the town. Instead of the gardens and farm I found a new world of books. There was a large house called a library with hundreds and hundreds of books. The room I liked best was marked "Natural Science." Some of the books were too difficult for me to understand at first. Others were quite easy because I had lived on a farm. Here was a book about earthworms ; how often I had seen the little brown heaps they made as they burrowed in the ground ! Here was another about the way life began ; why, I had learned already that new life came by the birth of plants from seed, of birds from eggs, of little animals and human babies from their mothers.

But the only living things I knew about were those large enough for my eyes to see. There were books in the library which told about tiny, tiny plants and creatures, living, moving, multiplying themselves, far too small for human sight. Pictures showed me how beautiful they were. They lived in water, or on the leaves and roots of crops, or inside insects, animals and men. Some of these tiny living things were the servants of health, many of them were the causes of disease and death. This invisible life had gone on for long ages in Europe, in Asia, in Africa, but no one ever saw it or knew that it was there. Great diseases swept through land after land, men and

WHY THIS BOOK WAS WRITTEN

cattle suffered and died from the effects of them, but no one knew of the tiny creatures who were the cause.

At last—so I read in my library—two instruments were invented which increased the power of the human eye. This was done by the clever



MAN LOOKING THROUGH A MICROSCOPE

use of bits of glass or crystal arranged in a special way. The telescope enabled men to see countless stars millions of miles away. The microscope enabled them to see infinitely little things, hitherto unseen.

How I longed for a microscope that I might see this hidden world for myself. At last I

HEROES OF HEALTH

found a way. A pretty little horse, or pony, called Kitty, whom we used to ride, was sold. Half the money paid for her was mine. It was just enough to buy a microscope like the one in this picture. For years it was my greatest joy. I would put one little drop of water, in which a leaf or plant stem had decayed, under the glass (or lens) of my microscope and gaze on the swarm of living creatures it held. They moved about, eating, poking one another as they passed, lashing the long hairs which helped them to swim through the water, multiplying as I watched.

Men and women who were studying the hidden world which the microscope made large and clear wrote books. These I found in my library. The story of what they saw was like a fairy tale or a great romance. They were all thirsty for knowledge, but some of the seekers had even a higher aim. These men of science thought there must be some way to stop disease and keep it from getting hold. They suspected that some of the hidden plants and living creatures which the microscope laid bare had to do with disease. If only they could find out, how splendid it would be! So they set to work, some in Europe, some in America, some in Africa, some in Asia. They were as patient as the farmers and as wise; they had as many disappointments too. They gazed down their microscopes till their eyes were weary. They taught their fingers to do difficult and delicate

WHY THIS BOOK WAS WRITTEN

work. They tried the same experiment over and over again—one man tried 606 times before he was sure he was right. They found out the amazing life stories of tiny foes to health who lived, now in a mosquito, now in a man. Some men of science got the diseases from which they were trying to save others and lost their own lives. But it was all worth while. For some diseases a cure was found. Others are being ceaselessly studied still. Millions of lives have been saved. The stories about these men and women of science are some of the finest in the world.

III

One day what I learned on the farm and from books came together in my mind. New thoughts were born. I saw that I myself was part of this wonderful world. The body God had given me was like that of the plants and animals on the farm. It needed from me the care the farmer gave to them. Without proper food and shelter, without cleanliness and good habits, my body would not prosper and work. If I neglected it others near me would suffer. For God in His world has bound us all together, great and small, and if one suffers so do all the rest.

I saw it was His plan that plants and animals, boys and girls, men and women, should be full of life and health. Beauty and gladness came from Him, the strength of muscle, the energies

HEROES OF HEALTH

of mind and will. He made us like that ; He wanted to bring us back to the image in which we were formed. So I set myself to grow and flourish like a healthy plant in the garden, a swift-winged bird in the field, a young strong animal on the farm. I tried to build up what was weak in my body, to keep under what was unworthy, to make use of what was strong.

Then I saw that the aim of the men of science must be my aim too. They had gone out all over the world to fight disease. Some were in hospitals and welfare centres. Some were in their studies searching out the secret causes of disease ; others were fighting the ignorance and dirt which gave disease its hold. While one man was studying the germ of plague or seeking for that of cholera, another was persuading unwilling people to be vaccinated in a London slum ; or trying to rid an African kraal of the rats which bring the plague infection ; or trying to save an Indian village from frequent illness by causing a well to be digged.

I saw that the battle of health could never be won by officers without an army. Sanitary inspectors and medical officers said that, and they were right. I remembered story after story which told how disease had swept through a country because the people in town and village would not help to stay its course. So the thought of health for myself broadened out into service for the health of others. Then I found myself

WHY THIS BOOK WAS WRITTEN

close to the greatest of all the true stories of the world.

The whisper of promise that comforted man in the opening story of the Bible swelled to a splendid message when Jesus Christ was born. When the Lord of Life became man and dwelt among us He brought salvation—that means health—for the souls of sinful men. He brought health too for bodies broken by disease. No sufferer was too foul for Him to touch, none too far gone for Him to heal. He gave whole days, from morning to evening, to the suffering and the weak. He went about doing good and healing all who were diseased. He called His followers to teach as He taught and to do as He did. The message of health for soul and body was committed by Christ to His Church.

This book is written for boys and girls in Africa who are just stepping out into life. Its aim is to share with them what at the same age I began to learn about health.

I cannot take them back to the white house on the hillside in Ireland, or the big library with its well-used books, or let them look through the microscope I bought when Kitty was sold. But I can tell them some of the health stories which stirred me then and which stir me still. I can introduce them to heroes greater than Napoleon, Chaka, and others who brought war and death. Mine are Heroes of Health who brought victory

HEROES OF HEALTH

over disease and pain. Here are battles worth re-fighting, battles whose praises may be sung again and again. Here are warriors under whom we may serve in a noble conflict worth more than all the glories of ancient tribal war.

CHAPTER 2

TWO ANCIENT HEROES OF HEALTH : THE STORIES OF MOSES AND OF HIPPOCRATES

LONG centuries before the things now taught in school about the human body were discovered, there were men who stood out among others as leaders in the battle of health. Some, like Moses, worked mainly to prevent people from getting ill ; others, like Hippocrates, worked mainly to cure them. Moses spent his life in the countries where Africa and Asia meet ; Hippocrates belonged to the little country of Greece in the south of Europe, on the borders of the Mediterranean sea.

I

Taking his story as given in the Bible, Moses had an adventurous life. He was the child of a race once prosperous, which had come to be hated and feared. The people of Israel, welcomed at their first coming to Egypt, were afterwards thrust down into bondage. They multiplied so quickly that the king of Egypt gave orders that the boy babies should be killed as they were born. Moses was a beautiful baby. His

HEROES OF HEALTH

parents hid him for three months ; then he was too lively to be concealed. So they made a little basket, put the baby in it, and laid it in some reeds near the bathing place on the river. The daughter of the king came down to bathe ; she saw the baby and loved him at once. He was taken to the palace and treated like her son. All the learning of Egypt was his.

But his heart was with his own people all the time. One day he fell under the anger of the Egyptians and fled into the country. Here in a land of poor pasture and thorny bushes he became a shepherd and learned the ways of desert life. Water had to be drawn for the flocks out of wells. Moses married the daughter of the sheep owner, a wise man who taught him many things.

One day he was called by God to go back to Egypt and deliver his people. At first he refused, for he was afraid ; then he went. He did not return to life in the palace, but took his place with the Israelites in their bondage. He went many times before Pharaoh the king as the messenger of God, bidding him let the people go. Again and again Pharaoh refused. The story of all that happened can be read in the Bible. Moses, who had already learned how to lead a healthy life in the desert, learned now in Egypt how dreadful disease could be. One terrible plague after another came upon the land of Egypt. At last the king could hold out no longer and let the people go. They crossed the Red Sea

TWO ANCIENT HEROES OF HEALTH

safely, passing from Africa into Asia. They marched forward, under the leadership of Moses, towards the land which God had promised to their forefathers long before.

It was like one of the famous journeys of the African tribes. The whole body of men, women and children, their flocks and herds with them, went on from place to place. They had no settled land with crops or gardens to give them fresh green food, they had no well-known streams or wells with good supplies of water. They ate and drank what they could get by the way. Enemy tribes were near them and they often had to fight.

Moses had a heavy task, for the people were ignorant and often gave way to discontent. He led the people to honour the presence of God in their camp. He taught them laws of health which were afterwards written in "the books of Moses." He cared for them through their long wanderings in the desert. When at last he brought them for the second time to the borders of the promised land, and had trained a younger man to be their leader, he went up into a mountain and died alone with God.

II

During the World War of 1914-1918 a young Medical Officer was in camp in a hot, unhealthy district in eastern Europe. The British officers

HEROES OF HEALTH

asked him for a lecture on how to keep the camp healthy and save the soldiers from disease. Flies were tormenting him and everyone else ; he would certainly talk about flies. Then he remembered there had been a plague of flies in Egypt, so he turned up the story in the Bible and read on and on. He found that the plagues of Egypt had followed one another just as diseases were doing in the war camps, one seeming to spring out of the other. Then, to his amazement and delight, he found that the things he was teaching his men to do to avoid illness were just what Moses had said and done in the desert centuries before. When the war was over he wrote a book called *Moses the Founder of Preventive Medicine*—that is, of treatment which is given to prevent the coming of disease.

The story of calamity as it fell upon the land of Egypt began with the water of the Nile. The river ceased to be life-giving and became poisonous ; the fish died and caused a horrible smell. The people hastened to dig wells, but that takes time, and water grew very scarce. The frogs, unable to live in the poisoned water, poured out on the land and died. Their decaying flesh made the air foul, even the pastures were impure. The people had no water in which to wash themselves, so they became infested with lice. The cattle were parched with thirst and became infested too. Then—it always happens so—grievous swarms of flies were bred, filling the

TWO ANCIENT HEROES OF HEALTH

houses, covering the land, defiling the food, spreading filth and infection everywhere. Sick-ness spread among men and beasts, boils broke out upon them. Many cattle died. A great storm of hail flooded the land and swept all the filth off the surface into the wells. Locusts came in swarms and destroyed the crops, and the food supplies of the miserable cattle. A great darkness, caused perhaps by violent winds blowing sand in thick clouds from the desert, broke down what courage and hope were left. Thus when the tenth and last plague of sudden deadly disease began, the people, weak in body and discouraged in spirit, were ready to fall victims to it. In every house there was one dead. The cattle were stricken too.

It was after a time such as this that Moses led his people out of Egypt. He naturally wanted to guard them from disease. What steps did he take? Before I answer that question, please think for a moment what you would have done in his place. You have learned something about hygiene and sanitation in school, some of you will soon be teaching these subjects in class. If you had to take a hundred thousand persons with their cattle through a country where food and water were scarce, and where you could not grow green food or get fruit, what advice on health would you give the people? What laws would you make? Write your thoughts on a piece of paper and compare

HEROES OF HEALTH

them with what Moses did. Here are some of his plans.

In his mind, cleanliness was part of godliness. The presence of God in the camp left no place for anything unclean. The home and all that was in it, the bodies of the people, the clothes they wore, must be clean and sweet. He knew that dirt and disease went together.

He taught a great deal about food. He could not give the people the "fleshpots of Egypt," the good fish, the fresh vegetables for which they craved. But he got them the best food and the purest water the land could give. He bade them never eat unclean and unwholesome food. He had food kept under cover to protect it from flies.

He taught them to burn rubbish, not leaving about in camp anything that was filthy or unclean. He knew that dirt dried in the hot sun and was blown about into water or on to food. He knew that it bred swarms of flies—and he had seen in Egypt what flies could do. As the people were constantly moving they had no proper latrines. Indeed in those days it was the custom—it is sometimes the custom still—to use quite openly the ground near the dwellings of the people. Moses gave them a better law. Here are its actual words: "Thou shalt have a place also outside the camp whither thou shalt go forth abroad. And thou shalt have a shovel among thy weapons. It shall be that when thou sittest

TWO ANCIENT HEROES OF HEALTH

down abroad thou shalt dig therewith and shalt turn back and cover that which cometh from thee." This law of Moses is still a key to health.

Moses made rules about infectious illness in the camp. The people sometimes welcomed them as little as similar rules are welcomed to-day. Special officers were appointed to carry out the laws. The authorities had to be told when any infectious disease appeared. The patient was separated from his friends. Those who had been with him were watched in case they had taken the disease. The house and clothing had to be disinfected. The whole process took a long time. These things which Moses did in the wilderness were forgotten by most people for hundreds of years, but their value has been discovered again.

Moses is one of the greatest of the heroes who have fought in the battle of health. His special followers are the men and women in every land who are engaged in work for public health. Some are at the head of a department in a colony or a great city ; others work in the villages or perhaps in a single school. But Moses is a leader too for everyone who has a home to keep sweet and wholesome, a body to train in good habits, and friends who are influenced by what he does. Health and healthy habits are quite as infectious as disease.

HEROES OF HEALTH

III

Ancient Greece was only a little country, but it has enriched the world by gifts of glorious poems and books. Greek art is the wonder of every country. The Greek love of beauty and of health has influenced each generation. Thousands of boys and girls are learning to-day from the writings of ancient Greece things which are shaping their lives.

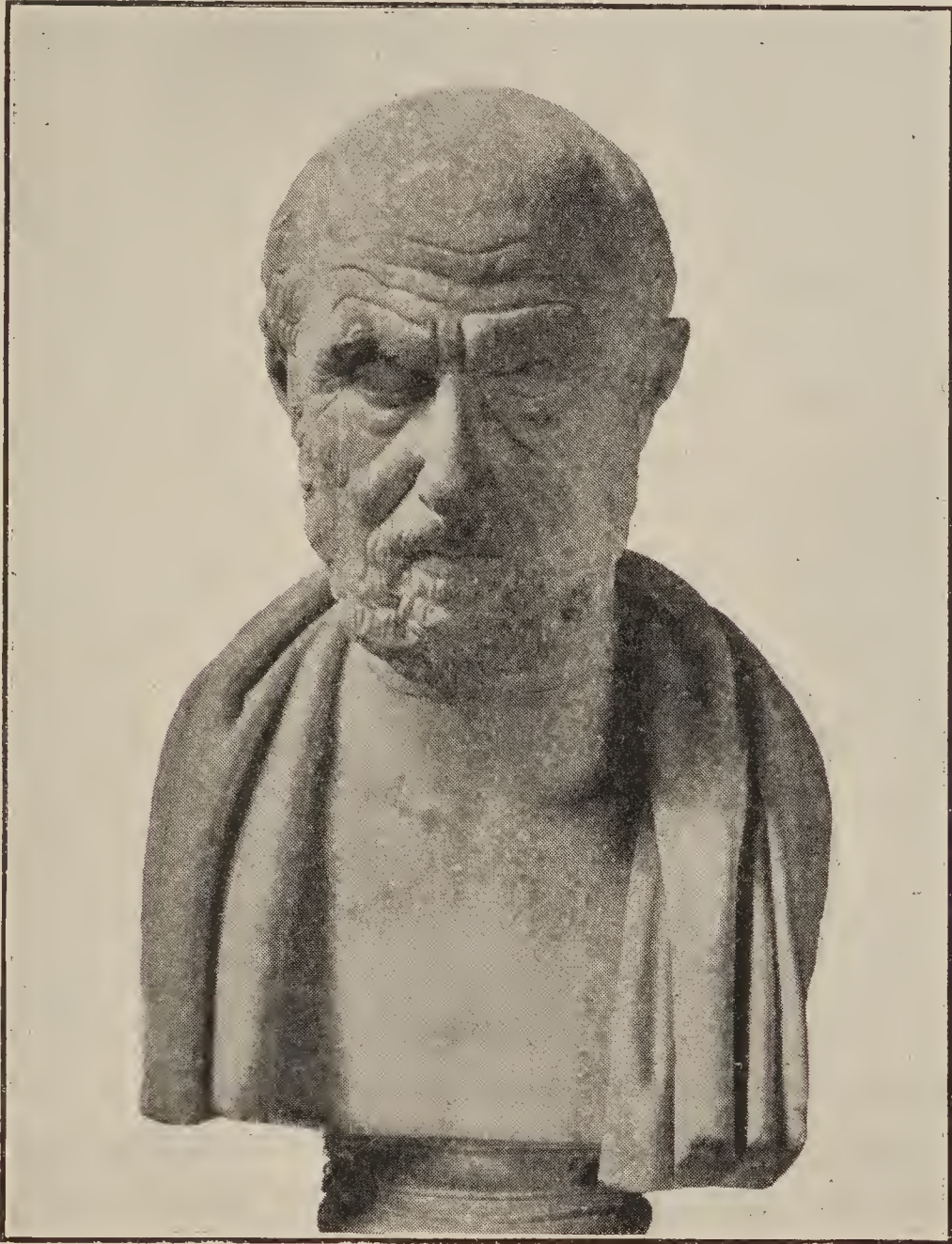
But ancient Greece has given the world no more priceless treasure than the character and work of the great doctor Hippocrates, known as the Father of Medicine. He was born in the island of Cos, in Greece, nearly five hundred years before Christ, and about seven hundred years after Moses. We know so little about him that we might expect him to be a mere shadow in history. We know he was a doctor and that his fathers were doctors before him ; he had pupils and numbers of patients. Many writings bear his name, but we cannot tell which of them he wrote himself. That is about all of which we can be sure. Yet the man stands out as one of the noblest figures of the ancient world.

You see on page 19 a copy of the head which the Greeks made in marble to show what they thought Hippocrates was like. Here is what an English doctor has written about the influence of the great Greek doctor in every age.

“ In beauty and in dignity the figure of

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Hippocrates is beyond all praise. He will ever remain the type of the perfect doctor. Learned, trained to observe, kind, with a profound



THE GREAT GREEK DOCTOR (A HEAD CARVED IN WHITE STONE)

reverence for the claims of his patients, orderly and calm, pure of mind and master of his passions—this is the Father of Medicine as he appeared to those who worked with him and

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succeeded him. He took pains to record all his own experience for the benefit of other doctors and for the relief of suffering. It is a figure of character and virtue which has had a moral value to medical men in all ages like the influence exerted on their followers by the founders of great religions.”

The spirit of Hippocrates is seen in the oath or promise which bears his name. This oath was taken by medical students in ancient Greece when they were facing the duties of their profession. It was used in the training of medical students in every land for more than two thousand years. It is too long to quote in full. An English lover of ancient Greece—Sir Gilbert Murray—has shortened it like this :

“ The disciple swore to honour and obey his teacher and care for his children if they were in need ; always to help his patients to the best of his power ; never to use or profess to use magic or charms ; never to supply poisons or perform operations which were against the law ; never to abuse the intimate position which a doctor naturally obtains in a house where there is sickness, but always on entering to remember that he goes there as a friend and helper to every one in it.”

Sir Gilbert Murray goes on : “ The man who first drew up that oath did a great deed. He realised the meaning of his high calling, and stated it in words which doctors of unknown

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tongue and in undiscovered lands accepted from him and felt to express their aims for well over two thousand years.”

Hippocrates and his followers were ignorant of many things which doctors, nurses and hospital assistants know to-day. But they were wise enough to know that a good doctor—like a good nurse—watches the patient rather than the disease. We have still notes of forty-two of Hippocrates’ cases in which every change in the patient from hour to hour and day to day was written down.

This great principle of watching the patient, noticing what he does, how he feels and any changes in his condition is one of the good gifts which ancient Greece passed on to modern Heroes of Health. Doctors and nurses in Africa to-day follow the plan of Hippocrates. Listen to the questions they ask their patients and the friends who bring them to be cured, and notice how often no one can give them the information for which they ask.

CHAPTER 3

FROM DARKNESS TOWARDS DAWN: WITH THE STORY OF FRANCIS OF ASSISI

I

THE great days of Greece and Rome were followed by centuries in which men settled into a sort of dull despair. Writers and poets and men of science lost their light and freshness. Instead of watching nature wisely, as Hippocrates did, doctors used dry rules and stale learning in caring for the sick. Very little was done to stop the spread of disease. Belief in magic and in charms gained more and more hold.

During these long centuries when the world moved slowly from darkness towards dawn, one bright and beautiful light shone softly in every land. It was the light of love. The dark shadow of magic and witchcraft could not hide it. Ignorance could not darken its gleam. In lands where the sick and aged were often neglected or cast out to die there were always some whose love sought out the sufferers. Pity could not heal disease, but pity was divine and found a way to help. St. Francis of Assisi was the greatest of these men of love.

FROM DARKNESS TOWARDS DAWN

He was born in Assisi, a town in Italy, more than seven hundred years ago. His father was rich, and at first Francis rejoiced in all the good things of life. Then he had a vision which called him to the service of God. He gave up everything and lived as a poor man with no possessions. He said he had taken Lady Poverty to be his bride. He went about like his Master, Jesus Christ, loving others and teaching them to love. His followers lived in poverty with him ; they had no money and no settled home. At first they were few ; but before Francis died thousands of people in many lands had joined him, all seeking to live a life like his. He founded a great religious body within the Christian Church.

Though St. Francis died when he was only forty-six his influence had spread far and wide. His love was like sunshine which makes hidden life burst out and grow. Or like a fresh cool spring which makes new channels as it flows out into a thirsty land. Long after his death beautiful pictures were painted and noble books were written because of what Francis had done and taught. People still go every year to Assisi to think about him and to thank God for his life.

Francis had love in his heart for all beauty and all life. He cared for the hills and the forests, the fields and the flowers. He wrote a beautiful song in which he praised God for “ our noble brother the sun,” for “ our sister the moon and

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for the stars, clear and beautiful in heaven.” He sang about “our brother the wind,” “our sister the water,” “our brother the fire,” and “our mother the earth.” When he was dying and in great pain, he had this song sung to uplift and comfort him. All creatures were dear to him, especially bees, lambs and birds.

Numberless stories are told of hunted creatures and wounded birds which fled to him for protection and hid in the folds of his clothes. We read of a tame grasshopper who used to perch on his hand, of a hawk who nested near his little dwelling and woke him for prayers every day, of the larks—birds of the morning—who came and sang in the twilight when he died. And there is the story of his sermon to the birds which must be re-told here.

Francis was on a missionary journey. As he drew near a town he saw a number of birds hopping on the ground or resting in the branches of the trees. Here is the sermon he preached to them. It is told by Thomas of Celano, one of his followers and friends.

“Dear birds, my brothers, you ought to love and praise your Maker, for He has given you feathers as clothing, and your wings with freedom to fly everywhere. He has given you nobility among all His creatures and has given you the pure air as your home. It is He who feeds you and He gives you the great trees wherein to build your nests, so that you have not to sow,

FROM DARKNESS TOWARDS DAWN

or reap, or work at all. You are the delights of His tenderness and care.”

We are told by the old writer that the birds listened and stretched out their wings and came close to him. He walked about among them and blessed them and made the sign of the Cross over them.

Shortly after, Francis stood at the window of a house in a little town, preaching to the people who stood below. The birds under the roof made such a noise that he could not be heard. “My sisters, you birds,” said St. Francis—so the old story goes—“you have made noise enough. It is my turn to speak now. Be good enough to keep still and listen to what I say to the people.” The birds are said to have sat silent, each in his place, till the sermon was done.

These stories may not be actually true, but they rest on the great truth of St. Francis’ love for all the beautiful creatures of God. Still more deep and wonderful was his love for the sad, the suffering, the diseased among men. In the days of St. Francis leprosy had spread into Europe from the East. Every country had many lepers. They were driven out of towns into miserable places. No cure for their disease was known. They were shut off from all the joys of life. No one seemed to care for or comfort them. Francis, loving all that was beautiful, turned away at first when he had to pass a leper. He could not bear the sight. Then the love in

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his heart rose up and made him ashamed. He went back to the leper and kissed his hand. (He did not know how to help the leper without risking the spread of disease ; we have learned since his day.) Another day he took a leper to the place where his followers were and ate out of the same dish with him at dinner. He taught his followers to make comfortable homes for lepers and to take care of them. In one of these homes there was a leper who from his great sufferings became bitter and ungrateful and spoke evil words about God. No one could satisfy him. St. Francis himself came in one day. " Let me try what I can do," he said to the angry man. " I will do anything you like." " Then wash me," replied the leper, " for I cannot bear the smell of my wounds." So Francis had water warmed with sweet herbs and stripped the leper and washed him with his own hands. It was a Christ-like deed. In his last message to his friends, Francis bade them always care for lepers. Ever since the Franciscans, as his followers are called, have done as their founder did.

II

Let us picture two lads just leaving school, one a fine young African, the other an English boy. Both are starting out to fight the battle of health in this twentieth century. Beneath the different

FROM DARKNESS TOWARDS DAWN

colour of their skin their bodies are alike. Each boy has behind him the customs and experience of the people or tribe to which he belongs.

The African boy's forefathers, perhaps even his own parents, found in the spirit world an explanation of everything that happened. They saw no natural cause for the ills of life. To them, health or disease, prosperity or famine, could be traced back to the work of good or evil spirits. As evil spirits were supposed to be very strong all hearts were filled with fear. At any cost they must be driven away, or deceived, or bribed by sacrifices and gifts. The crops, these African forefathers thought, did not depend so much on good seed, fertile soil, or careful weeding, as on what the spirits chose to do. It was they who withheld rain, so when the fields and gardens grew parched and dry, rainmakers were called in to work spells and save the people from ruin. When disease appeared in a village no one asked whether it was caused by bad water, or dirt, or infection. The evil spirits were believed to be angry and had begun to punish the place. Perhaps some special man or woman had offended them. So a diviner or sorcerer was brought to find out the guilty person. Dark and cruel deeds were often done. If a little child was ill, the evil spirit which caused disease must be dealt with. So a medicine-man dressed in strange and terrifying garments would be called in to exercise his arts. He might "throw bones" or

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work spells to find out who had bewitched the sufferer, or do things which caused pain to the child in hope of driving the evil spirit away. Belief in such a spirit world as this, with its power over the health of men, animals and crops, lies in the racial background of every African boy.

The English boy, like his African brother, believes—but in a different way—in a spiritual world which has to do with health.* He does not scorn the African past, for he recalls the past of his own country. In the days when Hippocrates was writing words of wisdom among the Greeks, many parts of England were still peopled by wild and warlike tribes. These people were clothed in skins and adorned with blue paint. When the Roman armies invaded England and made it a province of the Empire of Rome, they brought new knowledge which the English tribes slowly learned.

Witchcraft as well as magic found its place in the past of both the African and the English boy. At one time many people in England were thought to be witches. They were supposed to have great power and were sometimes drowned or even burned alive. English people are ashamed as they remember their forefathers' ignorance in being afraid of witches and their cruelty in treating them as they did.

The English boy will remember that his forefathers, too, did not know that dirt and disease

* See Chapter 12.

FROM DARKNESS TOWARDS DAWN

went together. They were not as wise as the people of Moses hundreds of years before. Many of the great towns of Europe had bad water, overcrowded houses with no fresh air blowing through them, and filthy streets with no proper drains or latrines. In the fourteenth century a visitation of plague swept over Asia and Europe. It was called the Black Death. In England six out of every ten people died. In London the dead numbered over 100,000. The descriptions of those days are too terrible to repeat. Twice in the next three hundred years London had such sickness again. Then a great fire raged for five days, burning many of the worst houses and cleansing the streets from filth. London has still to fight steadily against disease, but it is now one of the healthiest cities in the world.

Here is a London story which might have come from thousands of towns and villages in Africa or the East. Year by year the dread disease of cholera kept breaking out in London. It began in unexpected places and no one could suggest a cause. At that time—it was about the year 1832—there was a famous spring in London known as the Broad Street Pump. The water had a delicious taste. Every day people came from long distances, worked the pump handle to draw up water from the spring, filled their water-pots and went home. The pump and the cholera were as active as possible. Presently it began to be noticed that it was those who drank water

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from the pump who went down with cholera. There was a quiet, hard-working Hero of Health named Dr. John Snow, who had found out that the poison of cholera was carried by water into which drainage from latrines had soaked. He was sure that the Broad Street Pump and the cholera had something to do with each other. He gave his opinion in four famous words: "Remove the pump handle." His order was obeyed. No one could henceforth draw water from the Broad Street Pump. The cholera disappeared because the water containing its poison was no longer drunk.

But now the African boy is telling of the new chance of health which is coming to his people to-day. He has seen a doctor come to his village with trained African assistants by his side. As he unpacks his boxes not a trace of magic is to be seen. Sick people are brought to him; he carefully examines each one. Medicine is given. Aching teeth are pulled out. Sores are cleansed and dressed. Blind eyes are in many cases opened, but the doctor has to say sadly that there are some whose sight no skill can restore. A few of the patients are very ill. Some have limbs badly injured or burned. Others have lumps outside or inside them which need to be removed. These patients are invited to go to the hospital, even if it is some days' journey away.

The lad's face brightens as he names one and



MEDICINE MEN—THE NEW WAY AND THE OLD

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another who went from his own village suffering and helpless, and returned in a few weeks cured. The story which has gone round is wonderful indeed. It tells of the whiteness and cleanness and order of the hospital ; the large room full of fresh air with its rows of beautiful beds ; the good food, the kindness of everybody, perhaps most of all, of the white English nurse. Then on the great day, it describes how the patient, after breathing some strong vapour given by the doctor, fell into a long deep sleep. He woke up to find that the crooked limb was straightened or the lump that was such a burden was gone.

III

Not magic, but knowledge had done all this, knowledge won by Heroes of Health who studied and watched and made experiments in one country after another. The work of such men prepared the doctors now in Africa for their task. They know to-day how the parts of the human body—bones, muscles, nerves and organs, all hidden from sight under the skin, work together for health. They know how to get at disease which has laid hold of some secret part and if possible remove it. They know how the blood flows in a man's body. By keeping a light finger resting on the pulse in his wrist, they can tell whether a patient's heart is working properly

FROM DARKNESS TOWARDS DAWN

during that long sleep. They know how to keep the cuts they have to make clean and healthy, so that they heal quickly and do not turn into foul yellow sores as wounds in the village often do.

Dozens of men of science, among them the great Sir Humphry Davy, worked to find out how patients could be put into that sleep which makes operations which used to cause such agony quite free from pain. America led the way in finding out ; a man of science in Germany prepared one of the best vapours ; a splendid doctor in Scotland, Sir James Simpson, began to use it in 1846. Like a true Hero of Health he tried it first on himself. I have seen in his house the spot where his family found him one day under a table, quite unconscious, because he had given himself too big a dose.

Three other men whose discoveries played a large part in fitting doctors for their work in Africa and elsewhere are Vesalius, Harvey and Lister.

Vesalius was a Belgian born in the middle of the sixteenth century. He devoted himself to anatomy, that is the study of the parts of the human body. He made the first correct pictures of many of its parts. Having studied in universities in his own country and in France, he went on to Italy. He taught with such brilliance and power that when he was only twenty-four he was made a professor in the famous university of Padua in Italy. He wrote a great book, with

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many drawings in it, and had it most beautifully printed. Copies of it can still be seen.

The doctors of his day were furiously angry because this young man differed from what they and their forefathers taught. They said he was mad. Under this attack Vesalius got angry and in a fit of temper burned a huge volume full of invaluable medical notes, the record of his studies of the human body. It is a sad story. Vesalius wrote himself ere long, "I have since repented more than once of my impatience." The greatness of his life ended when he gave up research and became a court physician, twenty years before his death.

The lovely old university of Padua was the training ground also of William Harvey, the celebrated English doctor who took his degree there in 1602. A painted shield still bears his name aloft among the other students of his day. He returned to England and studied as his special subject the movements of the human heart. He published a small badly printed book, very unlike the beautiful volume of Vesalius. But his discovery puts him in the foremost ranks of Heroes of Health. For centuries it had been known that the blood moved to and fro in the body, there are wonderful old pictures showing what it was supposed to do. But it was Harvey who discovered that the blood moves—as it were—in a circle. The arteries carry it out of the heart, which starts the current

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by contracting ; then the arteries carry the blood to all parts of the body, and the tiny blood vessels bring it right through the flesh and up to the surface. It is returned by the veins to the lungs where fresh air is drawn in to purify it. At last it is sent back to the heart which pumps it out on its rounds again. The sure knowledge of this gained by the " immortal Harvey " has been an enormous aid in the care of patients in Africa and other lands.

Joseph Lister (afterwards Lord Lister), one of the most beloved of London doctors, a man of gentleness and charm, was at work when Pasteur and Manson were making their discoveries. Before his days, more than half the patients who had operations in hospital died because tiny germs got into the wounds and caused the flesh to decay. Men, women and children had horrible sores, and no one could cleanse and heal them. Lister discovered how to destroy the power of the germs and keep wounds healthy and clean. The splendid healing work done in hospitals and by doctors and nurses all through the world is based on what Lister learned and taught.

Our intelligent African boy has also a tale to tell about smallpox. In some villages half the elder men and women are badly marked by the disease and many are blind. But the boys and girls instead of scars all over them have only two or three small marks on one arm. He recalls

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how a little party arrived one day to stop the spread of smallpox from villages near at hand. Scores of Africans, young and old, sat in rows while an assistant cleansed a space on their upper arm and another put a drop or two of fluid upon it. Then the leader came and made a little scratch so that the fluid just got through the skin. For a few days there were some rather sore arms in the village. Then the spots dried up. But a wonderful thing had happened. For years to come those who had been vaccinated were in no danger of smallpox, even if it raged all round.

Edward Jenner was the man who gave this knowledge to the world. He was a quiet country doctor in England, and as he rode round to visit his patients he watched and listened and made notes. In his day smallpox was a very terrible disease. In Europe sixty million people had died of it in a century. In England more than half the people were marked by smallpox, and of those who got it only half recovered. Jenner noticed that cows had a disease like a mild kind of smallpox which made sore spots on the udder or milk bag. Those who milked these cows sometimes got this cowpox on their hands and arms. A story went round the English farms that those who took cowpox never got smallpox after it. Jenner watched and made notes for five years. At last he was quite sure that the mild and harmless cowpox made a man "immune" to the deadly smallpox—that is, he

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was secure from being invaded by it. He took a tiny portion of the discharge from a spot of cow-pox and put it into the arm of a boy. Afterwards he put a little real smallpox discharge on the same arm and the child got no harm. Before long Jenner was "vaccinating" several hundreds of poor people every day and making no charge for his work. He did not know clearly about the great battles between good and evil microbes which were going on wherever there was life. But he had brought to light a great principle on which the Heroes of Health who followed him worked.

In the first year and a half, 12,000 people were vaccinated in London and the terrible death rate from smallpox sank from 2,000 to 600. In the United States of America vaccination was found to be a complete protection against smallpox. In one of the States there has not been a case of smallpox for over fourteen years. In Berlin, the capital of Germany, where everyone is obliged to be vaccinated, smallpox is almost unknown. From the first there were people who did not believe in Jenner's discovery. There are some still. But in all the continents—Europe, America, Asia, Africa—thousands and tens of thousands rejoice at the benefits he has brought.

CHAPTER 4

THE FARMER'S FRIEND: THE STORY OF LOUIS PASTEUR

I

Now we come to stories of Heroes of Health in more recent years. The first is Louis Pasteur. He began life in a simple home in a country town in France. His parents were descended from a long line of working people—the sort who are the backbone of a nation. His mother's family were gardeners. His father was first a soldier, then he settled in Arbois and earned his living by steeping hides in pits full of water and making them into leather.

The boy was sent away to school, but he was so lonely that his father brought him home. He said he missed the smell of the pits in the yard—a smell none of his neighbours enjoyed. But before long Louis woke up to see the value of learning. He gladly went back to school and from school to college. He studied science eagerly, as many a boy in Africa is doing to-day. His special subject was chemistry. He became a pupil teacher. Presently good posts as a teacher were offered him in France. At twenty-seven years of age he married and had a home of

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his own. It was as happy as the old home at Arbois.

There was not much promise of greatness when he began his life, but he became one of the foremost men of science and was crowned with praise and honour before the close of his days. He fought the battle of health with skill and patience against the diseases of crops, of animals and of men. When he went to distant countries people could not stop cheering if he got up to make a speech. Many secrets of disease were still hidden from him, but he knew that his discoveries had saved thousands of farmers from ruin and saved the lives of many who were doomed to death.

What was he like, this man who "made happiness round him while he gave glory to France"? His picture faces page 41. He was short in stature, and after middle life a little lame. He had a fine head with dark hair sweeping back from his forehead and clear, wide-open, sparkling green-grey eyes. His strong face was half hidden by a close-cut beard. His quick movements were full of expression; his clear voice was sometimes sharply raised in argument, sometimes softened with feeling. He was a grave, generous man, and obeyed the voice of conscience. Careless mistakes or ignorant opposition made him impatient. He fought with vigour against dishonest thought and false opinions. But he was shy, child-like



LOUIS PASTEUR, LEANING ON A FRIEND, BEING APPLAUDED BY A GREAT ASSEMBLY IN PARIS. LORD LISTER, WITH HIS ARMS RAISED, IS ADVANCING TO GREET HIM.

THE FARMER'S FRIEND

in spirit, tender-hearted, kind. When thinking out a problem he went about the house in silence with deep lines on his brow. When he found the answer his whole face lit up and he called his family to share in his joy. In home and work, from the day of his marriage to the close of his years, his wife was his friend and helper, the good angel of his life.

When Louis Pasteur was forty years of age, and already famous, his father suddenly died. Hastening to Arbois the son was only in time for the burial. After that was over, he went back to the empty house, looking out on the old water pits. He wrote a long letter to his wife Marie. It opens out to us his loving heart. Here is part of what he said : “ I have been thinking all day of the marks of affection I have had from my father. I owe everything to him. When I was young he kept me from bad company and taught me the habit of working by his own most loyal and well-filled life. . . . You did not know him at the time when he and my mother were working so hard for the children they loved, for me, especially, whose books and schooling cost so much. . . . His affection for me was never troubled with ambition, yet I am sure that some of the success in my scientific career must have filled him with pride and joy. . . . Farewell, dearest Marie, and dear children. We shall often talk of the dear old father. How glad I am that he saw you all again a short time ago.”

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The closing years of Pasteur's life were made glad by the knowledge that in China, North Africa, South America, Australia and other lands, pupils of his were waging war against disease and using his discoveries. A splendid institute was built in Paris, the capital of his own country, to carry on his work. The love of friends gathered round him ; his wife cared for him tenderly ; grandchildren brightened him with their merry ways. During a severe illness, his friends, some of whom were men of renown, came two and two to watch by his bedside night and day. The celebrated French author, Alexandre Dumas, came to his room with a gift of flowers.

As the end of his days drew nearer Pasteur had no fear of death. He had a clear and simple faith in God. He believed he should meet with those he had loved on earth in the life beyond the grave. He was moved in the summer time to the country centre of his work near Paris, among gardens and forests. He rested under beautiful trees while his wife and daughter read to him. He grew weaker, but his eyes were still full of fire. The whole world watched for news of him. Men, women and children whose lives he had saved would have shared their strength with him if they could. At last he died peacefully, holding the Christian's cross in one hand and his wife's hand in the other.

II

While Pasteur, as a young man, was busy making for himself a name in chemistry, a note of human distress sounded in his ears.

Many French farmers were vine growers. From the grapes which grew on the vines they made vinegar, quantities of which were used as a relish with food. They also made light wine which was drunk by the people of the country or sold. Something began to go wrong with the vinegar while it was being made and with the wine after it was made. No one knew what caused the trouble. Things got worse and worse. The farmers were ruined ; the merchants who lived by buying the vinegar and wine and selling them again, grew poor.

Pasteur belonged to the days when microscopes were in use. He had already got to know a great deal about the kingdom of invisible life. He had studied the living germs which in their countless millions were mighty workers for evil or for good.

After long toil and watching, after repeating again and again his experiments with drops of fluid containing the tiny living beings which he found in the faulty vinegar, he was perfectly sure that he understood what was wrong. He told the amazed vinegar merchants of Orleans a marvellous story one day. He described the battle which went on in the large wooden tubs

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(or vats) where vinegar was made, between two kinds of microbes, as these invisible living things are called. One microbe was busy making proper vinegar, the other was busy spoiling it. He even put pictures of both microbes on a white sheet by means of lantern slides.

Then he showed how the vinegar makers could help the microbe which was their friend until it overcame the microbe that spoiled the vinegar. Those who believed him and did as he told them were able to make good vinegar again. He also found out the microbes which were causing disease in the wine and taught the farmers how to destroy them. Pasteur was learning a great deal from his work on wine and vinegar. He was mastering the working of laws among these tiny microbes, and gaining knowledge which was to serve the whole world through him and other men of science in future days.

But this study was stopped for a time by a call from other people in distress. There was a great silk industry in the south of France. The silk was first spun by little silk-worms who made lovely, soft, golden, silky nests for themselves. They went as worms into their nests ; then after a long sleep they came out as moths. They mated, laid their tiny eggs as fine as dust, and died. The farmers grew mulberry trees on whose leaves the hungry worms were fed. The country people cared for the little creatures and sold the cocoons to the mills where the soft

THE FARMER'S FRIEND

silk was spun into thread and woven into materials for garments. Lastly, down at the coast there were shops where the beautiful silk was sold, and from whence the merchants sent it to distant lands. All this prosperity had turned to distress and hunger before Pasteur was called in.

Thousands and thousands of the busy little worms were ill. Tiny black spots could be seen on their bodies ; they either died or spun silk too poor to be used. All sorts of remedies were tried and failed. No one knew what was wrong. Pasteur bent all his energies on the situation. He found out with his microscope that microbes were feeding on the silk-worms' life. He traced the history of these microbes with wonderful patience until he found them even in the tiny egg out of which the baby worm was hatched.

What the people needed was healthy silk-worms' eggs. But where could they be found ? You could not tell whether they were diseased or not when you bought them, for the disease had spread to Italy, and even to China, from whence the silk-worms had first come. All eggs were apt to be infected ; the people said, " There is no healthy seed."

But Pasteur found a way. Healthy mothers were bound to lay healthy eggs. So when the mother moth died after laying her eggs, Pasteur taught the people how to find out, by using a small microscope, whether the dead mother moth was infected or not. If she was healthy,

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the eggs were "good seed." If she was diseased, the eggs had to be destroyed. Pasteur also had quantities of healthy eggs bred and sold to the people. Some people laughed at what he was doing. But in place after place, where the simple country people patiently did what Pasteur told them, the disease grew less and prosperity in the silk industry returned.

To the end of his days, the vinegar makers and those who kept silk-worms remained Pasteur's grateful friends.

III

Why do the sheep and cattle die? This question was often on the lips of anxious French farmers about the year 1877. A terrible disease called anthrax was being studied by a brilliant man of science in Germany named Robert Koch. But here it was busy among the sheep in France, killing twenty or even fifty out of every hundred in a flock. Some pieces of land were known as "cursed fields" or "dangerous hill-sides" because so many of the animals who grazed there died. Certain patches which were specially rich with green pasture attracted the cattle; these were the most dangerous of all. A woman took some of the fresh green food home to her goat one day; the next day the goat was dead.

The Farmer's Friend was certainly needed—and he went. Pasteur and his helpers examined

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the fields and the hill-sides, they talked to the men who herded the cattle, they asked what was done with the bodies when the sheep and cattle died of anthrax. They found they were buried in the fields—yes, the bright green patches showed their graves.

Pasteur knew what Koch had been finding out in Germany ; he also knew what the great English man of science, Darwin, had been writing about earthworms, showing how they brought the soil to the surface from far below. He saw the little brown piles of earth left by worms on the graves of the sheep ; he found an anthrax microbe in the stomach of a worm. The cattle were actually eating the germs of disease off the graves.

By this time—though the work was full of toil and danger, for anthrax kills men as well as cattle—Pasteur was even able to separate the anthrax microbe from others and to grow quantities of it in little glass bottles filled with some nourishing fluid. Millions and millions of the deadly microbe lay in his hand. One drop of the living poison would kill him, or a cow or a sheep, in a few hours. He had also found out how to make the anthrax microbes weaker or stronger in their power. One of the most deadly diseases had been brought under control.

Then Pasteur made one of the greatest discoveries ever given to the world. He knew how Jenner had checked smallpox by vaccination

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(see pp. 36-37). Pasteur found that if he injected the weakened anthrax poison into a sheep or a cow—not enough to make the animal ill—and gradually increased the strength of the doses, he might afterwards inject the strongest anthrax poison into the same animal and it would do it no harm at all. The first injections were a protection against the others and against the disease. The cattle were made immune.

People were slow to believe that this great thing was true. But Pasteur proved it again and again. Sheep to which he had given no injection were allowed to graze on one of the deadly green patches ; they got anthrax and died. Others which were protected by Pasteur's weakened injections ate their fill on the same green patch and got no harm.

Like all true men of science Pasteur gave the news of his discovery to the world. He had quantities of the injection that protected cattle from anthrax made for the thankful farmers of France. Soon it was used throughout the world, in Africa and elsewhere. In France there were no more “cursed fields” or “dangerous hillsides.” Some cattle disease remained of course, but it could be controlled.

In like manner Pasteur studied some of the diseases of pigs and of chickens and found an injection which gave protection from them. There is not room to tell the stories here. He spent twenty years finding remedies for the

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diseases of vinegar and wine ; he was fifty years old when he found the secret of protecting cattle, sheep, swine and chickens from some of their diseases. He brought the life of the farm and the use of his microscope together in the service of health. He was over sixty years old when he made the discovery which was the crowning triumph of his life.

The horrible death which generally followed the bite of a mad animal was dreaded in every land. The danger of smallpox was so widespread that it was right to vaccinate everyone, but no general treatment to protect people from disease after the bites of mad animals could be given, for only a few hundred people were bitten in a year. Pasteur had already proved that the wise saying of Hippocrates and his school was true : “ All diseases have their causes which can be found by those who seek them.” So he set himself to find the cause of the disease and some treatment to cure those who had been bitten. The remedy would have to work for life more quickly than the poison could work for death.

Months and years of experiment rolled by. The story of them is too long to tell. At last Pasteur and those working with him saw a way to overcome the dread results of these bites. They were sure that injections which they had prepared could be given in stronger and stronger doses which would check the poison and save the sufferer's life. But the treatment had never

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been tried on a human being, and Pasteur, who hated even to give the slightest pain to an animal, shrank from so grave a risk.

The day came when he could hesitate no longer. A little boy named Joseph Meister came to him with his mother. He had been badly bitten in fourteen places by a dog which was proved to be mad. It was almost certain that the little lad would die in agony. Pasteur consulted some of the great Paris doctors who knew about his work. Should he give the injections to Joseph, or not? They bid him take the risk. Day after day the boy was brought by his mother. Each day the injection was a little stronger. Pasteur grew to love the child and could scarcely sleep at night as the last strong doses were given. Anxiously he watched during the weeks that followed. Joseph kept quite well. When it was clear that the treatment was successful the boy and his mother went home.

The next who came for treatment was a brave shepherd lad of fifteen, named Joupille. A furious mad dog had attacked some children who were playing near his sheep. He rushed to save the children and was able after a great struggle to destroy the dog, but he was terribly torn and bitten. He too was saved by the treatment Pasteur gave.

Then came nineteen Russians, big men in huge fur caps; the only word of French they

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knew was "Pasteur." A mad wolf had been in their village for two days and nights, biting and tearing everyone he could reach. Three of the men were so terribly injured that they died in hospital; Pasteur was able to save sixteen. Russia at that time was ruled by an Emperor; he sent his brother to thank Pasteur and to bring a splendid gift of money for the Pasteur Institute which was going to be built. But it gave Pasteur even more pleasure when in the list of those who were giving money for the building he saw the name of little Joseph Meister.

By degrees people who had been bitten and needed treatment came from all parts of the world. The first Pasteur Institute was opened in Paris on November 14, 1888, by the President of the French Republic. Then institutes in which the Pasteur treatment was given were founded in many lands.

CHAPTER 5

MOSQUITO AND MAN: THE STORY OF PATRICK MANSON AND RONALD ROSS

I

Mosquito and man are found together in the greater part of the world. Where they are, malaria is frequently found as well. It is a disease which has played a large part in history. It has weakened whole nations—some say it helped to bring the greatness of Greece and of Rome to an end. It has made broad districts, once fertile, unfit for human habitation. It has reduced the population of many a village to a group of wasted fever-stricken men and women, with a few dull, sickly children at their doors. Death does not come from malaria with agony or tragic haste, but it is said to claim about two million victims every year, more than plague at its worst. It is the cause of nearly half the illness in hot countries and touches many temperate countries too.

Men had talked and written about malaria for more than two thousand years. But no one knew its cause or its cure. It was given the name “malaria”—which means “bad air”—

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because they thought it was something poisonous blowing up from the swamps. It came from the swamps indeed, but it certainly was not bad air. About three hundred years ago a valuable remedy was found which is still largely used. A Spanish lady—the Countess of Cinchona—was very ill with malaria at Lima in Peru, where her husband was Governor. A friend sent her some bark from a tree ; her doctor gave it to her and she was cured. The precious bark was ground into a white powder and sent by the Jesuit missionaries to Rome where malaria was bad. The tree it came from was named cinchona, after the Countess, the powder was called “ Countess’s powder,” or “ Jesuits’ powder.” Then it came to be called “ quinine,” the name by which we know it to-day. It is a splendid remedy, but it would be impossible to administer white powder daily to the millions who dwell in malarious lands.

What was the cause of malaria ? How was it spread from man to man ? This question which meant so much to mankind was being eagerly and patiently studied as the nineteenth century drew near its close, specially by the great Frenchman, Laveran. Many men of science helped to throw light on the subject. We can only here tell the story of one, Sir Patrick Manson, linking with him his friend Sir Ronald Ross.

It is interesting to compare Sir Patrick

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Manson and Louis Pasteur, representatives of two nations who have so large a stake in the welfare of Africa.

Pasteur was a Frenchman by birth and brought to his work the special qualities of his people. Manson, born in Scotland and living mostly in London, was British in his mind and in his ways. Pasteur worked first for the farmers of his own country, though his discoveries brought help to the whole human race. Manson from the outset studied the diseases which are found in hot (tropical) climates rather than in Great Britain itself.

The Scottish boy, born in 1844, had a home as happy as that of the French boy born twenty-two years before. Manson was one of nine brothers and sisters. Like Pasteur he was not a brilliant boy, but he worked well and steadily. He was a good carpenter and could do anything with his hands. He had a taste for Natural History—the study of animals, insects and plants. He decided to be a doctor and took his final examination when he was twenty. A year later he took his degree. He was then a strongly built, tall, active young man with a thin handsome face and plenty of energy. He was cheerful, kindly and generous. Like Pasteur he had many friends. He was soon able to pay back what his father had spent on his medical training.

When he was twenty-two years old Patrick

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Manson was given a post as medical officer in China. He stayed in the country for thirteen years. He liked the Chinese people and learned to speak their language. He studied their past history and believed in their future. He said : “ In point of sagacity the Chinese are the elephant among the nations.” The Chinese liked and trusted him in return. The great Prime Minister of China, Li Hung Chang, was once very ill in the north of China. It was thought that he could not be cured. He entreated Manson, who was in the far south of China, to come to his aid. The British doctor was ill himself and suffering. To go meant taking a journey of 1,800 miles by sea. But Manson went, though he had to be carried on board the steamer. He was able to relieve Li Hung Chang at once. The great man wrote to him afterwards : “ My thanks I am unable to express, your treatment has completely cured me.”

Manson's duty in China was to look after the health of British sailors who came to Chinese ports and to take charge of a hospital for them. He also worked in a Chinese Mission Hospital. Some of the patients came with a disease, common also in parts of Africa, which caused huge lumps to grow on their bodies. The swellings, which might weigh fifty or sixty pounds, made the patient a burden to himself and his family. Manson often removed these ugly growths, but fresh sufferers kept pouring in. No true doctor

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could rest satisfied unless he found out the cause of the disease. How did the infection spread from man to man ?

Already a worm had been found in the human body which seemed to cause the swellings. But its life history was not known. With great skill and patience Manson spent every spare moment of his busy life in trying to find out. He left many questions for others to answer in later years, but he found out some wonderful things. Here are a few. He found out where the worms lived in the human body and why their presence sometimes made big tumours grow. He found that the female worms brought forth tiny living creatures which one day developed into worms. These were sometimes so many as to make quite a crowd in the human blood. He found that during the day-time a drop of blood from a patient might show nothing under the microscope, but that a drop of the same blood taken late in the afternoon or at night would simply swarm with the tiny living things. It looked as if the baby worm and the mosquito had the same time-table, for the mosquito too hid away by day and came out in the evening for a busy night's work, feeding on human blood.

Then Manson made one of those splendid guesses which lead Heroes of Health to their discoveries. As the little baby worms retired into the deeper parts of the human body by day

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and came right up to the surface where the mosquitos could suck them up as they fed at night, he guessed that it might be through the mosquito that the infection was carried from man to man. Manson examined the stomach of a mosquito under the microscope. It was full of the little baby worms active and alive. In one mosquito after another, Manson traced their growth and found out wonderful things. The little newly hatched worm babies sucked up in human blood at night by the mosquito were nursed in its body until they were again ready to begin their work in another man.

Manson's guess was perfectly right. It was the beginning of the great discoveries as to the relation between mosquito and man. But not until sixteen years later did another Hero of Health finish the story and show how the little living things within the mosquito could find their way back into the human body, there to cause discomfort, disease and even death.

While he was in China, Manson studied many more diseases and learned fresh secrets for the good of mankind. He was greatly honoured and founded a School of Medicine at Hong Kong for Chinese. Then in the year 1889 he left China and soon settled in London with his wife and family. He carried on his work on tropical diseases at the Seamen's Hospital in London, where many foreign sailors were to be found, and also began to teach young doctors who were

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going to the tropics and young missionaries as well.

As Manson thought of what he had learned about worm disease carried by the mosquito to men in China he came to believe that malaria must be carried from man to man by some kind of mosquito too. People laughed at him and called him "Mosquito Manson." But he held to his belief though he could not prove that it was true.

Then one day in 1894, Manson no longer had to search alone. A doctor from the Indian Medical Service, named Ronald Ross, came to London. Already he had been studying malaria, but he did not think Manson's view was right. However, when he saw what Manson could show him through the microscope, and heard all Manson had to say, he was convinced that the clue was worth following up. The two men walked off together down Oxford Street in London eagerly talking about mosquito and man. A few weeks later Major Ronald Ross went back to India and with splendid perseverance carried on the search. Many kinds of mosquitos sucked up human blood; which one gave the malaria microbe a home in its body? What happened to the microbe while it was there? How did it get back into the human body to give malaria to another man? The answer to these questions and others like them could only be got by examining every part of mosquitos again and

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again through the microscope—a delicate and difficult task. Dr. Ross said the microscope made the mosquito look as large as a hippopotamus and the microbes he wanted to find did not look bigger than little nuts. It took him from two to three hours to go through each mosquito—and he examined the stomach and other parts of hundreds and hundreds of them. “I found a beauty,” he writes one day, “and watched it for three solid hours exactly without taking my eyes off it. I shall dream of it.” “I have seen things these last three days,” he wrote again, “but have no time to write about them. I am dead beat now and the lids of my right eye are swollen and painful—at work from 7 a.m. to 7.30 p.m. with snatches at breakfast and tea.” For four long hot weary years the search went on. Twice Major Ronald Ross was ordered away to do government work which stopped his study of malaria. He was often tired and ill. But he never gave in and at last his questions were answered. He could announce to the whole world that the secret of malaria was known. Heroes of Health in other countries, notably in Italy, had been working too. The honour of great discoveries seldom belongs to one man alone. But Dr. Manson wrote to his friend : “You can justly claim to be the first” to find the malaria microbe in the mosquito and to show how it passes on that microbe to those whom it bites.

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The story of the part which the mosquito plays in malaria is truly a marvellous tale. Out of the many kinds of mosquito only one family does the work, and only the female of that. The male mosquito lives harmlessly on the juices of fruit and other vegetable food. The female needs to feed on blood, especially when she is laying eggs. This is, roughly, how it works. A man has malaria, a female mosquito comes and bites him. She sucks in the malaria microbes with his blood. We have now an infected mosquito as well as an infected man. Within her body the tiny microbes go through a number of changes, looking quite different at different times. At last the microbes make their way into the head of the mosquito and down into the tiny sharp weapon with which she pierces the human skin and through which she sucks up blood. But as she alights and pierces, she pushes a tiny drop of fluid down into the blood before she sucks it up. That tiny drop carries the microbes of malaria. We have now a second infected man, and soon there are likely to be several more infected mosquitos. So the circle goes round. There is no end to it unless mosquito and man can be kept apart.

During this toilsome search the older man in London and the younger man in India wrote constantly to one another. Manson entered into Ross's successes and failures, advising him when he was puzzled, and loving to tell men of science

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about each new thing he found out. The fifty-five letters Manson wrote to Ross are a noble example of how one man can encourage another. In somewhat the same spirit Gorgas and Reed worked together, as we see in Chapter 6.

When at last Ross had solved his problem Manson hastened to a great meeting of doctors and men of science in Edinburgh in July, 1898, and showed them what his friend had done for the health of the world. The honours which Ross in his loneliness had fully earned had come to him at last. Henceforth Major Ross (later Sir Ronald Ross), took a foremost place among the Heroes of Health, and is still serving mankind by waging war against tropical disease.

II

There was no possible ground left for doubt among men of science that what was called the Manson-Ross explanation of how infected mosquitos gave malaria to men was proved. But Manson wanted to convince everybody, because the help of ordinary men and women was needed if malaria was to be checked. He stated at a public meeting in London that he was going to prove, first, that people did not get malaria unless mosquitos of a particular kind bit them ; and second, that people who were bitten by infected mosquitos even in the heart of London would have malaria in a few days.

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There was a district round the city of Rome in Italy where malaria was very bad for several months of the year. The peasants who lived in this Campagna, as the district was called, all had malaria, young and old. They were miserable, lifeless and often unable to work. If strangers went to the Campagna between July and October malaria laid them low.

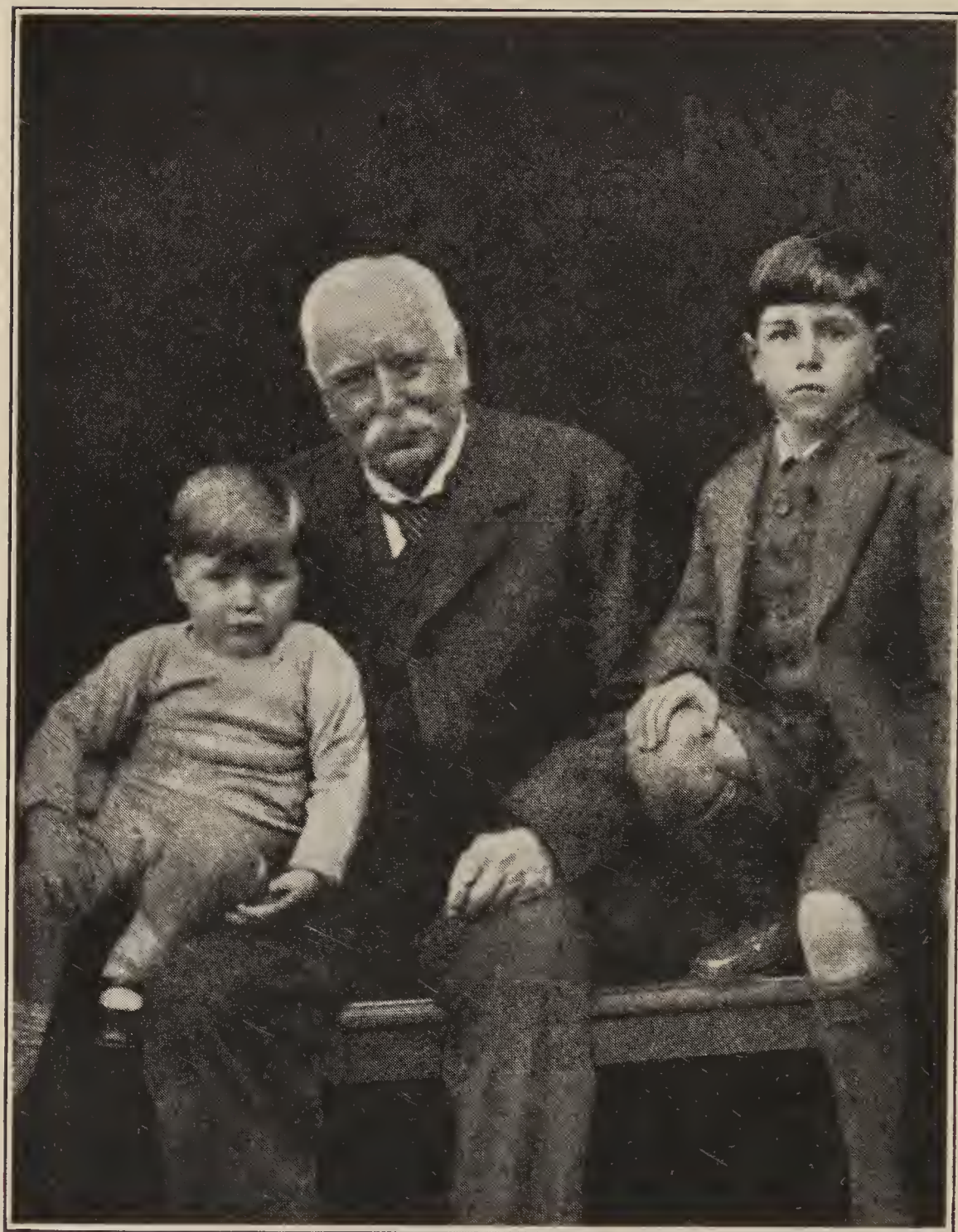
Manson sent to this disease-infested place a small wooden hut, the door and windows being protected by fine wire screens through which mosquitos could not pass. There were also mosquito nets for the beds. Three men, of whom two were doctors, went and lived in this hut from July to October when malaria was at its worst. The hut was placed near the mouth of the river Tiber. All round it the Italian peasants were full of malaria, one day burning with fever, another shivering with cold. Some workers in a Red Cross hut near by were down with malaria too. During the day, when the mosquitos were not biting, Manson's three men went in and out. Before evening came, they shut themselves into shelter in their hut. Every night the mosquitos swarmed round, singing their sharp little songs outside the screened windows. Not a single one got in. During the whole time, the three men were absolutely free from malaria in the midst of men, women and children whose strength was sapped by the disease.

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So far so good. The other half of Manson's proof was this. He arranged that several newly hatched mosquitos of the kind that carried malaria should be allowed to take a full meal from a man whose blood was full of malaria microbes. When their little stomachs were as full as they could hold, the mosquitos were put into a bottle and quickly and carefully brought from Italy to London. Hungry after the long journey, they were ready for another meal. There, in a room in London, they were allowed to suck the blood of two healthy men who had never had malaria before. One of them was Dr. Manson's own son. When the proper number of days had passed both men had attacks of malaria, just as if they had gone without shelter into the Roman Campagna. No one could deny any longer that Manson and Ross were right.

The discovery was made, but both men had a joy which was deeper even than that of leading the way to discovery. They cared, like Pasteur, for the welfare and happiness of mankind. The next chapter will show the blessings which followed for the human race through an understanding of the relation of mosquito and man.

As years went by Manson carried on in London his work of studying tropical diseases, bringing his clear mind and wide experience to bear on one after another. He went to and fro among the seamen in hospital; the British



SIR PATRICK MANSON AND HIS GRANDSONS

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government made him their advisor about medical work in Africa and elsewhere ; he was busy, useful and happy among his many friends.

Then a great thought came to him. The young doctors who were going out to India, Africa and other lands ought to be well taught about the diseases they would have to treat. Manson and Ross had been obliged to find out these things for themselves. But the young doctors ought to know beforehand. So Manson made plans and interested people who could give money ; the Government helped too, until at last the London School of Tropical Medicine was opened in 1899. Into it Manson threw all his energies. During his life more than 2,500 students took the course of study and went out after careful training to fight the battle of health in all parts of the world.

African readers of this book are likely to come into touch with a medical officer who is fighting sleeping sickness or malaria, who is trying to check cattle disease or to secure the proper care of wells and the cleaning up of towns or villages. The man who is doing this service was perhaps once a student at the London School of Tropical Medicine or at a school like it in Liverpool, where Sir Ronald Ross used to teach. The doctors at the Mission Hospital, too, may have been there.

The founding of the London School of Tropical Medicine was the crown of Manson's

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life It is now much larger, with many students and a fine library, but Manson's name is not forgotten. Good, happy and well-loved, he died in April 1922, in his seventy-eighth year. He is seen in the picture with two little grandsons by his side.

CHAPTER 6

VICTORY AFTER DEFEAT: THE STORY OF WALTER REED AND WILLIAM C. GORGAS

I

THE island of Cuba has had a troubled story. Christopher Columbus discovered it in 1492. Spanish settlers came and, like those of other races elsewhere, over-worked the gentle indolent tribes. Then, lacking labourers, the Spaniards bought West African Negroes as slaves. They were long held in captivity, but their descendants were set free. A strong race of Cuban people grew up, partly of Spanish descent, but anxious to govern themselves instead of being governed from distant Spain.

There was ceaseless trouble between the Spanish and the Cubans. Once there was ten years of war. Cuba was close to North America and the Cubans made constant appeals for sympathy and help. At last, when neither side seemed able to overcome the other, the United States stepped in. After some fighting with Spain peace was signed. Americans took charge of affairs till the island was settled. Then Cuba became an independent republic with a president

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and a government of its own. That was in 1902.

America made good use of the three years and four months during which her flag flew over Cuba. An army doctor, William Crawford Gorgas, who had been fighting disease, and especially yellow fever, in the Southern States, was sent out to deal with the insanitary conditions of the island. Yellow fever was conquering Cuba, coming back again and again when men least expected it and laying all strangers low. Gorgas and his wife had already had yellow fever which does not attack anyone a second time.

Havana, the capital of Cuba, with its lovely harbour, was deep in filth and rubbish. There was much illness in the city, though yellow fever kept out of sight. Sometimes in Spanish days there had been a thousand deaths from it in a year. Gorgas believed—there was only one old doctor in Havana who differed from him—that yellow fever was caused by dirt. The infection was supposed to spread from people who had the fever and especially from their bedding and clothes. So Gorgas had the heaps of rubbish and the bodies of dead cats removed from the streets, and if anyone had yellow fever their bedding was burned. Pictures began to appear in the American papers showing the beautiful clean streets of Havana. Gorgas was a very thankful man.

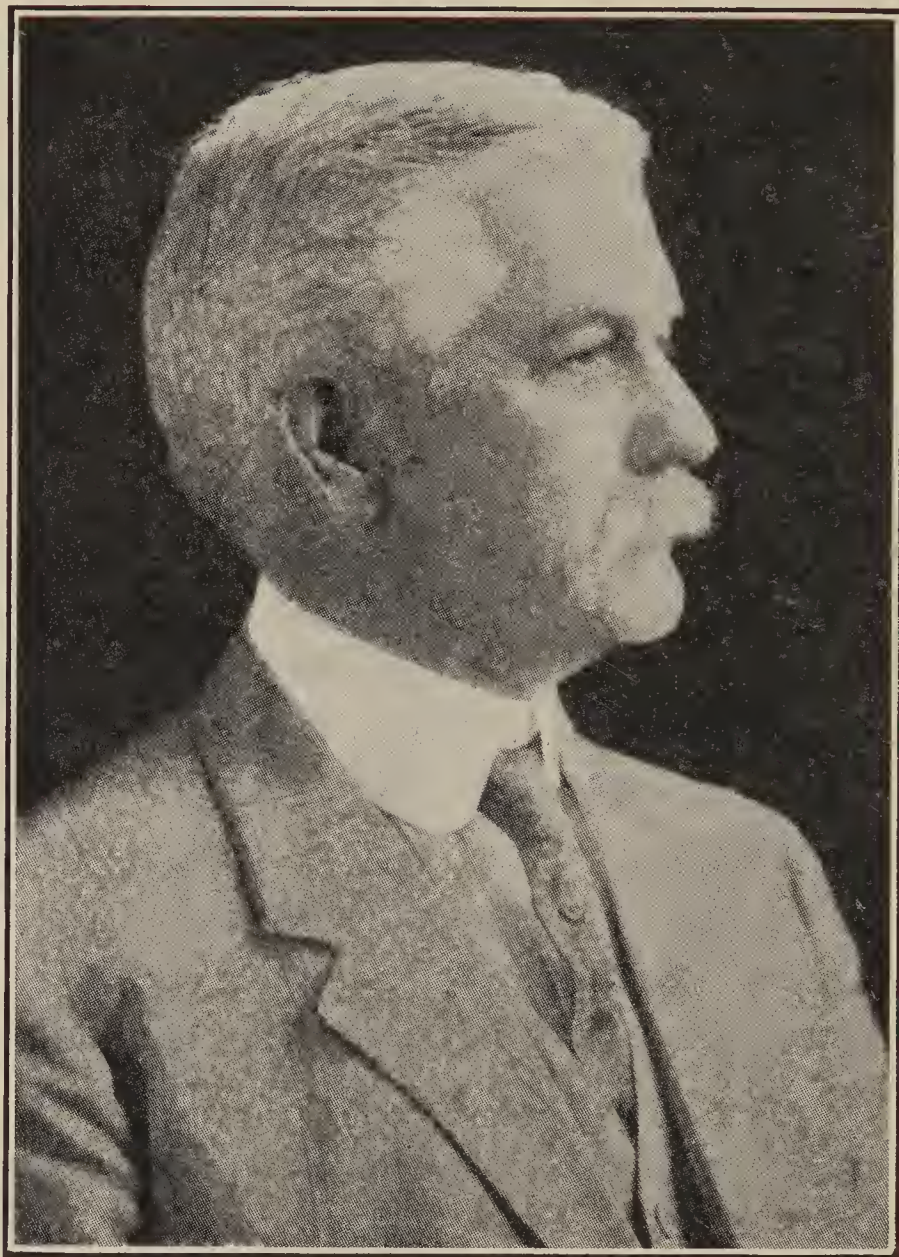
VICTORY AFTER DEFEAT

Now the dread yellow fever seemed always to fasten on people who had only just come. The regular inhabitants seemed to be immune. It lay in wait for sailors whose ships came into harbour, or soldiers just landed, or immigrants who came to settle on the land. The good day which had dawned for Cuba encouraged many Spaniards to come to the island—in one year as many as 25,000 arrived. Then the man who had cleaned up Havana had a rude awakening. Yellow fever began to increase. There were more cases than when rubbish filled the streets. Soon there was an outbreak among the people. Those who got the fever were separated from the rest, bedding and houses were burned. Still the fever got worse. Some who had nursed the patients never took the fever ; others who had been near no case of it got the fever and died. The real conqueror of Cuba—the yellow fever whose ways no man could understand—was reigning in the land. Gorgas fought on bravely, but he was fighting in the dark.

When men of action and men of thought work hand in hand something happens. Gorgas was a man of action ; there came to join him in this hour of need Dr. Walter Reed, who like Pasteur, Ross and Manson, was a man of science and of thought. The American government sent him and three other men to find out the cause of yellow fever so that its spread could be checked.

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Reed and Gorgas were alike in many ways ; both were men of high character, single purpose and true religion. They became close friends ;

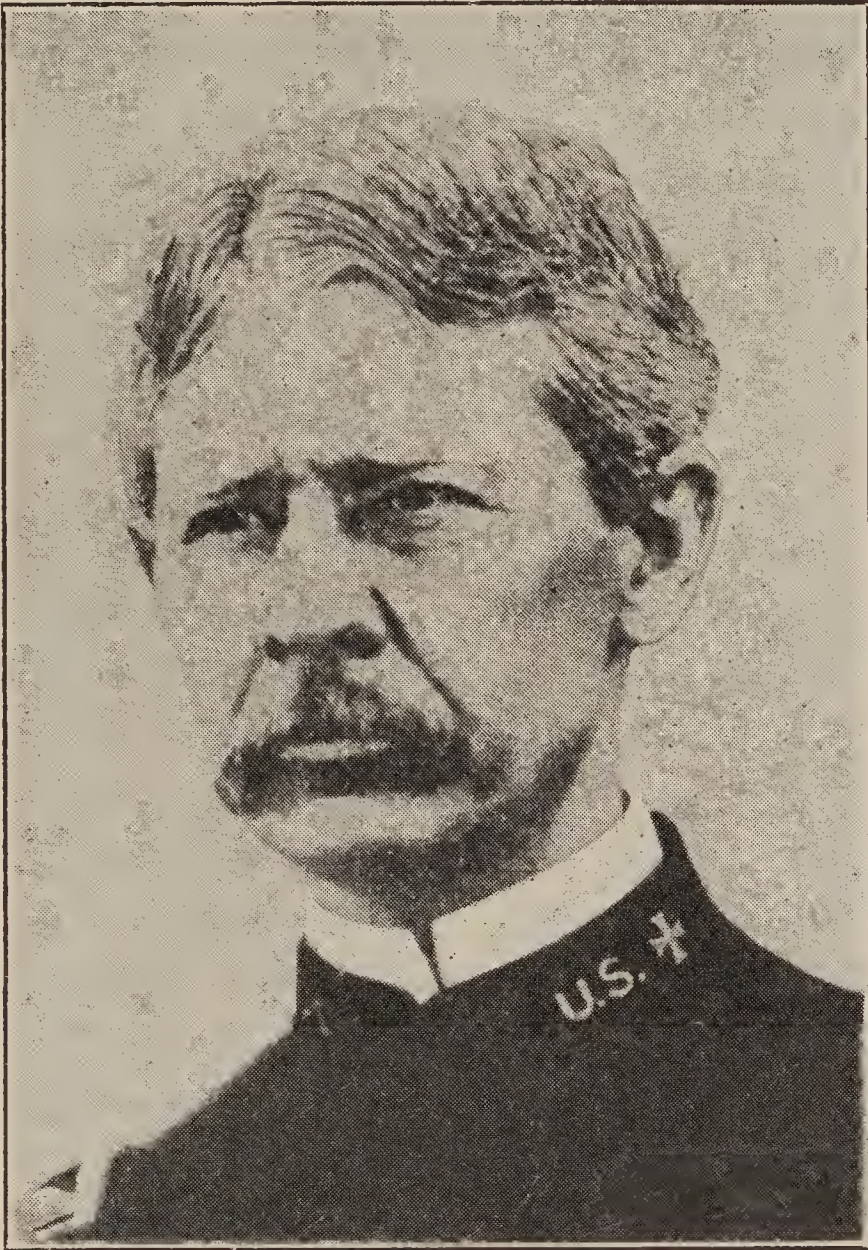


GENERAL W. C. GORGAS

each loved to give honour to the other. After Reed's death, Gorgas, who was then at the height of his fame, was walking in a street of Washington, the beautiful capital of the United States. He met one of the leading men of the country

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who had his little grand-daughter at his side. He said to the child : “ This is General Gorgas, one of our great men.” “ No, my child,” said



DR. WALTER REED

Gorgas in his gentle voice, “ only one who is trying to follow in the steps of a great man—Walter Reed.”

Dr. Walter Reed asked endless questions in Havana. Among others he talked to Dr. Carlos

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Finlay, the old man who did not agree with what Gorgas believed about the cause of yellow fever. Dr. Finlay had been telling everyone for years that yellow fever was spread by mosquitos. He even kept mosquitos in bottles and tried to prove his statements, but every experiment broke down. It was the fashion to laugh at Dr. Finlay, but Dr. Reed knew what Ronald Ross had found out about malaria in India, and he thought that Dr. Finlay was right. If mosquitos carried yellow fever it would explain why some unlikely people were stricken and likely ones escaped. Before long it was proved that the guess of the old Cuban doctor was right. But the proof was very costly, not in labour only but in human life.

In anthrax the microbes could be seen through the microscope. In malaria the microbe had been followed from the infected man into the mosquito that bit him. It had been traced right through all its changes within the mosquito and out again in the tiny drop of fluid which the mosquito injected when it bit another person, and on until malaria developed as the result of that poisoned bite. But the poison which causes yellow fever is so very tiny that no microscope is powerful enough to show it. Men of science still hope to find that microbe but are not sure that they have ever seen it yet.

Reed and his fellow workers sought for an answer to their questions with courage and care. At last they were sure that yellow fever was

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carried by a special kind of mosquito—not the one that carries malaria from man to man. It was a much prettier mosquito. They found that if this mosquito drank the blood of a yellow fever patient it took into its body the deadly germs. For a few days they were harmless ; then their poison woke to life. That mosquito became more dangerous to human life than the wild beasts of the jungle. A bite from it might give yellow fever—and four out of every five who got that died.

Some of Reed's companions allowed themselves to be bitten by infected mosquitos ; they got yellow fever and were most dangerously ill. For the sake of the thousands who fell victims to the fever it was vital that the way it spread should be made clear beyond doubt. More men were needed who would offer to take an infected bite. An American official gave money to offer as a reward. Dr. Reed told the soldiers of the risk they would run and named the money they would earn. Two men offered at once—a private in the army and a young clerk. “ The one condition on which we volunteer, Sir, is that we get no compensation for it,” they said. Walter Reed, who was an officer, said, “ Gentlemen, I salute you,” and put his hand to his cap as if they were superior to him in rank. These men, and others after them, were bitten and had yellow fever in due course.

But Reed had to find out whether men could

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get the fever apart from a mosquito bite. So he found some more brave white soldiers ready to experiment for the sake of humanity. He got a wooden hut outside the town and closed its windows fast. He collected the bedding in which yellow fever patients had slept and even the clothes in which they had died. Then the brave soldiers put on the clothes and slept for nights in the beds ; not one of them took the disease.

“ Rejoice with me, sweetheart,” wrote Dr. Walter Reed to his wife. For it was proved beyond possibility of doubt that the pretty mosquito with silver stripes was indeed the bearer of yellow fever to men.

II

General Gorgas, who had paid no attention to Dr. Finlay, was slow to believe Walter Reed. But he was convinced at last. “ If the mosquito carries yellow fever,” he said, “ I am going to get rid of the mosquito.” “ It can’t be done,” said Walter Reed. “ Perhaps not,” said Gorgas in his quiet way, “ but we shall try.” And soon the whole world, once filled with horror at the yellow fever of Havana, was filled with wonder as Havana became a city of health.

Patiently, like Sir Ronald Ross in India, the habits of the yellow fever mosquito were tracked down in Cuba. Ross found that the

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malaria mosquito laid its eggs in rough open places, on the edges of streams or in swamps, and in holes made by the feet of cattle and filled with water by the rains. The yellow fever mosquito lived only in or near the houses of men. The female would lay her eggs only in vessels of water or in water tubs by the house. She would even alight on your table and begin to lay her eggs. This gave hope that the breeding places of the yellow fever mosquito might be watched and most of the eggs destroyed. It was known, too, that a man with yellow fever would only infect a mosquito which bit him in the first three or four days of the disease. So by killing the eggs and screening all known cases of yellow fever during the infectious days, it was certain that far fewer mosquitos would carry the microbes from man to man.

Gorgas worked hard ! He found that nearly every pot or tin in Havana which held water had in it mosquito eggs. He had a central office where he worked all day himself while his little army of inspectors searched the whole city for their prey. He had a record made, not only of every house but of every water tank, pot or jug which people possessed. The inspectors put a little oil or kerosene into the water tanks. This made a film or scum on the top of the water, so when the eggs were hatched the baby mosquitos could not breathe and died. All household vessels had to be kept empty. When the

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inspector came round he counted the pots and jugs—if one were missing he would wait till it was found. The Havana Council passed a law fining anyone who let mosquitos breed on their premises. Gorgas had won the confidence of the people. He was so kind and gentle that they were ashamed to get angry when the inspectors came.

One day a huge Negro woman with flaming eyes arrived at the central sanitary office. She was in a fury because the inspector had told her to make some small repair in her little house. It was a crime to make a poor woman spend money, she said. A few minutes later she came out of Dr. Gorgas's room, all contentment and smiles. "Why do you look so happy?" asked someone who had seen her rage as she went in. "At last there's justice in Havana," she said, "and the King's in there." Gorgas had heard her story, told her what the mosquitos were doing in Havana and given her a brief gentle talk on what a good citizen ought to do. No public official had treated her as a reasonable woman, she had never heard before how yellow fever was spread. She was henceforth a soldier in the great mosquito war.

When Gorgas could leave his office he roamed the streets of Havana, poking among the empty tin cans, talking with women at their street doors, explaining to little groups about the anti-mosquito campaign. Though he had power to

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inflict fines or to put people in prison if they did not obey him he preferred to win their help by kindness and to get public opinion on his side. He was treated like the patron saint of Havana ; one of the finest streets in the city still bears his name.

Cuba has cause to be thankful for the years under the American flag. In the year before the anti-mosquito campaign began there were over three hundred deaths from yellow fever in Havana. The next year—1901—there were precisely five. Four years later a fresh outbreak began, but was promptly checked by the methods Gorgas used. Then the city which for centuries had been stricken by yellow fever remained entirely free from it year after year. It is free still.

Gorgas, the Mosquito Hunter, had won a victory indeed.

III

The continents of Africa and Asia are joined by the narrow Isthmus of Suez ; the continents of North and South America are in like manner linked by the Isthmus of Panama. Both these necks of land have been cut through by great canals, so that ships can pass with passengers or with goods for trade. The Suez Canal, the first made and the longest, shortens the voyage from Europe to Asia. The Panama

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Canal shortens the sea voyage from one side of North America to the other. It is worth while to look this up on the map.

Though the Suez Canal cost a great deal of money it was not very difficult to make. It was just a great trench through a sandy desert. When it was finished in 1869, the French engineer who had directed the work was put in charge of the Panama Canal. That was a much harder task. A way had to be cut through high mountains and forest and vast quantities of soil and rock had to be carried away.

When the French engineer first arrived he was told that there would not be trees enough in the forest to make crosses for his labourers' graves. When work began there were thirty or forty funerals every day. Five hundred young Frenchmen came out to work in the swamps ; not one of them lived to draw his first month's pay. Some French ships lay in the harbour with not a sailor on board—yellow fever had killed them all. The French engineers living in beautiful houses died off like the labourers on the canal. It is said that in eight years 20,000 white men working for the canal company died. In addition to this awful tragedy of disease and death, the company was short of money and gave up the work.

Now North America had long been waiting for a canal across the isthmus. The government decided to make a great venture and take over

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the making of the canal. This was in the year 1901, just after Gorgas had conquered yellow fever in Cuba. That, though the officials did not yet recognise it, was what would make it possible to finish the Panama Canal. It was clear that Gorgas was the right man to put in charge of public health in Panama. He went on a visit to see what needed to be done. Then in 1904 he landed with a little group of fellow workers at Colon, the town at the eastern side of the isthmus, and began his ten-year task. "I take it for granted that we shall get rid of yellow fever," he said. A few weeks later his wife took her place at his side.

As Sir Ronald Ross had proved in India, the truths of science often make their way slowly into the official mind. Dr. Gorgas was to prove this again in Panama. He was constantly urged to have the streets cleaned up and to let the mosquito alone. Men thought more of cutting down expenses than of checking disease, so he found it difficult to get the staff and the supplies he needed. By the use of his methods yellow fever had been banished from the large city of Rio de Janeiro in South America as effectually as from Havana. Yet there were still people who did not believe. They got in his way. Gorgas whistled softly as he went about his work—a habit of his when things were going wrong. "If only we could convince them!" he would say. "If only they knew!"

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At last the blow he had been dreading fell. The workmen sent from North America to cut the canal arrived. They were of many colours and many races, all fresh food for the mosquitos, waiting for their prey. Single cases of the dread fever were soon reported ; then there were groups ; more and more were added to the numbers till a wild panic seized the labourers. Those who arrived one day sought on the next to take ship and leave. It seemed as if the American adventure were going to end like that of the French.

Gorgas worked and worked, covering every inch of the ground with his helpers as he had done in Cuba, visiting every house in every street, clearing up thousands of places where the mosquitos found a breeding ground. There were quantities of their eggs even in the holy water basins in the Roman Catholic churches. The fine modern hospital built by the French on high ground at Ancon seemed to give yellow fever to patients who went there with broken limbs. At last the cause was found. Troublesome little ants had been annoying the patients by climbing up into their beds. To stop this, the legs of the beds were placed in small stone basins filled with water, which the ants could not cross. But this made a beautiful resort for the mosquitos ; Gorgas found the water in the basins full of their eggs. The basins were emptied, the windows were screened, the hospital knew yellow fever no more.

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Gorgas had still, like all pioneers, to face opposition and misunderstanding, but he found a firm friend in President Roosevelt, the head of the government in the United States, who believed in him and upheld his plans. In less than six months the anti-mosquito campaign was a success. The scourge that afflicted Panama for four centuries was wiped out. The long-desired canal could be made.

Having dealt with yellow fever, Gorgas turned his attention to malaria—a far more difficult task. This he could not banish, but it was greatly reduced. He also improved the housing conditions of the Negro workers so that pneumonia almost disappeared. By the time Gorgas had completed his period of service the death rate from all diseases was lower in Panama than in any American city. From being a centre of pestilence the isthmus had become one of the healthiest places in the world. A great English doctor, named Sir Malcolm Watson, still working as one of the Heroes of Health, visited Panama and described Gorgas's work as "the greatest sanitary achievement that the world has ever seen."

Before he left Panama, Dr. Gorgas was the first man to pass by water from one end to the other of the still unfinished canal across the isthmus. By that time he was sixty years old, his black hair had turned silvery white, but he was full of life and energy. He looked forward to fighting

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in other lands great battles of health such as those he had won in Cuba and Panama.

IV

Work was waiting for Gorgas as soon as he was free. The first call came from Africa. Among the Negroes working in the mines on the Rand in South Africa there was an outbreak of pneumonia, one of the diseases Gorgas had fought in Panama. It was unknown to most of the tribes of South Africa, so it was specially dangerous to them. A member of the Transvaal Chamber of Mines read of what Gorgas was doing at Panama ; he visited him there and got him invited to come and inspect the conditions under which mine workers lived in South Africa. Gorgas gladly consented to go. He visited many parts of South Africa. In his report he pointed out the need for more space and better housing for the mine workers. His advice was acted on. In a few months the outbreak of illness ceased.

The homeward journey took Gorgas through England where a great welcome was given him. " Perhaps of all living Americans," said one of the London newspapers, " Dr. Gorgas has conferred the greatest benefit on the human race. The whole world, particularly the British Empire, with its large tropical possessions, owes him a debt which Britons are proud to acknowledge."

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The universities did him special honour. Oxford gave him the honorary degree of Doctor of Science.

Gorgas next made a tour in South America to places where the yellow fever still lurked. He worked with a famous International Health Board which was set on stamping out the disease. When he got home America was on the eve of joining in the World War and Gorgas worked hard to find the medical staff and the medical supplies for the army, to ensure the health of the soldiers, and to provide for their proper care when wounded or stricken by disease. He had magnificent success.

Shortly after fighting was over (November, 1918), a fresh call came to General Gorgas from Africa. Cases of yellow fever had broken out here and there along the West Coast from Senegal to the Belgian Congo. What did it mean? Was there danger of an outbreak there? The question is not fully answered yet, and Gorgas had no share in seeking the solution. He was sixty-six years old, but he did not decline the call. He went with his wife and a little group of fellow-workers to London. One night he became ill in his hotel and was taken to a hospital, his wife being constantly with him. He slowly lost strength. The King of England, who had intended to give him publicly a title of honour, came himself to the American doctor's bedside, made him a Knight Commander of the Order of

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St. Michael and St. George, and spoke words of strong approval of his work.

Four weeks longer General Sir William Gorgas lay in his room looking out on the busy river Thames flowing beneath his windows. "If this is dying, it is very comfortable," he said. His wife wrote afterwards, "His spirit sought after God and His kingdom, picturing the future life with the simplicity and sweetness of a child."

So died William Crawford Gorgas. The *Lancet*, one of the greatest medical journals of the world, said, "He was the best known and the most successful medical administrator not only of his own age, but of any age, and his work is comparable only with that recorded of Moses." The British government gave the great American a public military funeral in London before he was laid to rest with honour in his own country. The procession passed through the streets from the hospital to St. Paul's Cathedral. Many flowers were sent in token of respect and admiration. One wreath lay alone on his coffin ; it was the tribute of another Hero of Health—Sir Patrick Manson—whose own term of active service was drawing to a close.

CHAPTER 7

RATS! THE STORY OF THE PLAGUE AND OF ARTHUR JACKSON

I

THE grim ghost of plague has moved down the centuries, sometimes hiding itself for a time, then reappearing to strike terror into the hearts of men. Many of the great pestilences which swept Europe before and after the coming of Christ and down to the seventeenth century were almost certainly outbreaks of plague. The disease so often began at seaports and spread inland that it seemed to have been brought in ships. Europe did not suffer alone. A million lives are said to have been lost long ago in one outbreak in North Africa ; at another time China lost many more.

After the great plague in London (see page 29), the outbreaks in Europe grew less violent, lingering longest in Constantinople and other Eastern parts. A few cases of plague keep appearing year after year in Asiatic countries, in East and Central Africa, and in many parts of the world. These are full of threat and peril, sources of danger to the whole community. No one knows

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at what moment plague, like a smouldering fire, may break into flame and spread through the land.

Plague is always caused by the presence of a special microbe, discovered by Dr. Yersin and Dr. Kitasato of Japan, which invades the human body and multiplies there. We shall see in a



PLAGUE MASKS WORN TO-DAY

moment whence it comes. The disease takes two forms ; one produces lumps, called buboes, which appear on different parts of the body ; the other form goes to the lungs. Both kinds are dangerous and infectious, but lung plague is much the worse of the two. Those who get it seldom recover. Those who nurse the sufferers do so at the risk of their lives. Doctors, nurses

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and hospital assistants, in spite of taking great care, sometimes take the disease. Once in South Africa a doctor and his whole family, except one little girl of eleven, died. It was at the beginning of an outbreak and no one knew that the illness was plague. Even the men who bury the dead are sometimes struck down themselves.

Those who nurse patients with lung plague have to keep their mouths and noses covered with cotton masks lest they breathe in infection. Long ago men went about in strange plague dresses, wearing masks in which spices were put to purify the breath. Here are pictures of one such dress worn three or four hundred years ago, and of the plague masks used to-day.



ANCIENT DRESS WORN WHEN
VISITING PLAGUE PATIENTS

The worst danger of lung plague is that it can be spread widely and carried long distances if people move about. Those who have been in a house with a case of plague ought to be kept apart from everyone else for at least a week.

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But people who are frightened or ignorant often break away with grave results.

A terrible outbreak of lung plague in the northern part of Asia, where Japan, Russia and China meet, was started by one Chinese labourer who died of plague in a country inn. The Chinese police closed the inn and put nine men who had been with the labourer under guard to be watched. But a soldier who was part owner of the inn got angry because his business was interfered with. He collected twenty other Chinese soldiers ; they attacked the police and set the nine men who were being watched free. Two of these men, who were already infected with plague, managed to reach some coal mines more than a hundred miles away where 4,000 Chinese miners were at work. They lived in crowded half-underground dwellings where disease was sure to spread. Plague broke out, and before long a thousand of them were dead. Some of the frightened people hastened to a place twenty miles away. They had already caught the infection and soon there were more dead round them than in the coal mines they had left. As each outbreak came, people hastened this way and that in search of safety, but always the plague went with them ; in one big town more than three thousand died.

This is one story out of many which shows how disease is ignorantly carried about.

If plague is to be stopped from spreading in

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its deadly way, moving on to seek fresh victims in place after place, the answer to the question “ What is the cause of plague ? ” must be known. We have already found some strange carriers and causes of disease which our fathers never suspected. But for generations people have thought that rats had something to do with plague. It was noticed that when rats got ill and began to die, human beings soon got plague—the form with lumps or buboes—and began to die also. This happened in different countries.

At last the whole story became clear. The microbe that causes plague was found in the rats that got ill and died ; more than that, it was found in great quantities in the rat fleas that had lived on the infected rats. The rats passed on the plague microbe to their fleas ; when the rats died the fleas had to find a new feeding ground. So they moved on—plague microbes and all—to the human beings who had allowed the rats to share their home, to go in and out of their grain stores and even to run over their food. The infected fleas bit their human hosts ; the plague microbe got its chance—and took it. All this has been proved over and over again ; it is perfectly certain that the bite of an infected rat flea spreads the plague among men. And once plague begins in the form with buboes no one knows how soon the microbe may make its way to the lungs. Then lung plague breaks out and one man infects another with ghastly certainty.

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What is to be done ? One line of action is already clear—*get rid of the rats*. This is easier to say than to do, but slowly we are learning everywhere that the rat should be driven out of human habitations. These pests are always unclean with their fleas and lice, with their fouling of grain and other food. But in times of plague they are a deadly peril to life. When rats turn sick and die all wise men fear.

When plague is moving on steadily from place to place, invading one district after another, the health officers take steps to try to check its progress. They have travellers from an infected district examined at a point on the road before they pass on to a district that is free from plague.

Some years ago plague was creeping up in East Africa towards Ngoniland. Though the roads were carefully guarded the medical officer was a very anxious man. He could reckon with people, but rats were beyond his power. He knew that the villages and houses in Ngoniland harboured enormous numbers of rats. If plague once got among them it would lay its deadly hand upon the people ere long. The Ngoni were too well used to rats to share his alarm. What was he to do ?

One day he confided his fears to a missionary who was wise and who loved the people. A bright idea came to him. "Leave the rats to me," he said. The medical officer was content to do it, for he knew the kind of man the mission-

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ary was. In a day or two a strange message went out to all the little village schools scattered through Ngoniland. "All school fees are to be paid in rats' tails for a month." The boys and girls pricked up their ears in amazement. Week by week their parents found it hard to provide the tiny coin of money or the handful of produce from the garden which paid for the schooling. How exciting to go home and tell them that the fees could be paid in rats' tails !

In every school, of course, a lesson was given on the reason for rat destruction and the need for burning or burying the bodies of the rats that were slain was explained. At the end of the week boys and girls marched up to present to the teachers bunches of rats' tails which were then thrown on the pile outside the school house and burned.

In the village churches the collections were taken in rats' tails. By this time the fathers and mothers were learning from the children what they had learned at school about the danger of rats in village and in home. There were sermons about it too in the churches, so when "Rat-tail Sunday" was announced the whole congregation, from the old women to the little children, from the men to the boys, came bearing thin tails in bunches to be accepted with thanksgiving—were they not an offering to save the lives of the people?—and then burned. The smoking piles outside schools and churches rose high as fresh

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tails were heaped upon them and the rat population of Ngoniland was enormously reduced. Plague did not enter the country ; the medical officer, the missionary and the people had worked together with good success.

II

The rat is not the only member of his family who is a carrier of plague. His pretty cousin the ground squirrel has more than once given it to a few people in the healthy land of California. In the cold hunting-grounds to the north of China there is another rat cousin, the marmot or *tarabagan*, who has long been a grave danger. The scattered tribes hunt the fierce little animal, kill it, and sell or barter the furry skin ; they often eat the flesh and store the fat for use. The tarabagans are very active and not at all easy to catch. They run faster than dogs and dive down into their long holes underground. But when they are sick, dogs easily catch them and even children kill them and bring them home. Now when a tarabagan is sick it generally has plague. Case after case of plague among the hunting people has been traced to a sick tarabagan. Even when the skins are stored in large quantities for trade they need careful disinfection, or they may carry plague through infected fleas and lice.

Happily the great hunting fields have a very

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small population, so plague lingers on in a few scattered cases for years without a great outbreak. But at last there comes a time when sickness multiplies among tarabagans. Then the country is full of danger for any people who are passing through.

In 1910 and the following year medical officers and missionaries on the borders of Manchuria, as this northern district is called, saw many signs of trouble ahead. News kept coming in that numbers of tarabagans were dying, that fresh cases of plague were breaking out, and that down the railway, right through the infected country, thousands of Chinese labourers were travelling towards the south. It was the Chinese New Year and the men were going home for their short holiday. It meant that they were passing through a district full of infection and then scattering into the great overcrowded ports and cities of China. One labourer carrying plague infection might mean the loss of thousands and thousands of lives. A few hours showed that there was ground for fear. Lung plague began to appear among the labourers. Trains going southward were stopped. There, at the railway stations through which the trains had to pass, a terrible fight began. Away to the north were the little sick tarabagans, down to the south were the cities of China with their closely packed millions. Between them stood a small strong group of Chinese and of medical missionaries, using every

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means to keep the pest from getting through their guard.

At first the labourers, so suddenly stopped on their journey, were made as comfortable as possible in railway waggons. Then special camps were prepared into which those who had been in touch with any case of plague were put until it was safe to let them go. Every day fresh cases began. They were taken to the hospital and cared for till they died. In an outbreak of lung plague there are—alas—no recoveries. Plague began to break out in the city—ten, twenty, seventy cases in a few days. The Plague Bureau divided the city into districts with officers who went from house to house. Some of the Chinese objected to this. Why should a shop be closed, or a house, if plague broke out in it? If one man died in an inn, why should thirty others be kept under guard for a week? Why should the sanitary police, in their clean white coats, be allowed to go everywhere? Why, above all, should not the people do as they liked with the bodies of the dead? Wild stories went round about what happened in the isolation camps and in the hospitals. The Plague Bureau tried hard to instruct the people. They had large posters put up on the walls and houses, giving information and telling true stories of the way that plague was being spread. If you had been in the city of Mukden in the plague months of 1911 you would have seen the following story

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in strange Chinese writing posted up on the walls.

Two carts arrived at a village inn one day in the time of the plague. They were laden with tobacco leaf and other country produce. The carter put them both in the courtyard. In one of the carts, hidden from sight, were the bodies of two who had died of plague. The carter had been paid to take the corpses to be buried in the graves of their fathers, instead of being burned with the hundreds of bodies in the town. In the night the carter got frightened and slipped away very early before anyone was about. He took one cart with him but he left the one with the bodies behind. The owner of the inn waited two days, hoping the carter would return. Then he took some goods off the cart to pay the carter's bill—and saw what was there. He was filled with terror. He was afraid to send for the sanitary police lest he should be blamed. So he buried the bodies secretly and hoped for the best. In a few days twenty people died of plague in that inn, the owner among them.

At last the Chinese were roused to action when such facts as these became known. They began to help instead of hindering. Plague was kept out of scores of villages by the sensible action of the people themselves. At the end of three months the worst was over. Then there came a glad day in which the sanitary officers had not a single fresh case of plague to report.

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The Chinese government invited a party of experienced doctors from eleven different countries to come together, in the borderland where the plague had been so bad, to consider what could be done to prevent outbreaks in the future. The president of the conference was Dr. Wu Lien-Teh, a Chinese doctor educated in England. He fought the plague all through the outbreak of 1910-1911. He has been fighting it ever since. He is Director of the Manchuria Plague Prevention Service. He takes care of the health of the tarabagan hunters and sees that everything is done to prevent plague from breaking out or spreading abroad. When another bad outbreak began ten years later he and his Chinese staff of helpers were able to check its course. He has written a big book of nearly 500 pages which has been published by the Health section of the League of Nations. It contains the wisdom of the doctors who met in the Mukden conference, and all the experience Dr. Wu has gathered since. The statement in Dr. Wu's book which has most importance is this :

“ There are few infectious diseases which can be so easily controlled as lung plague. In fact when isolation of the sick and separation of the infected are strictly carried out, combined with proper disinfection of houses and disposal of corpses, an outbreak is bound to decline quickly. *Unfortunately efforts to control an out-*

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break are often hindered by the inaction or resistance of the population. The opposition which sometimes meets medical officers is quite disheartening."

III

All the great things that have been done in the world have been founded on sacrifice. The Christian religion has a Cross at its heart ; the Founder Himself laid down His life to save men. Many have followed in His steps. There have been martyrs, like those in Uganda, who died for their faith. There have been doctors and nurses—some of them missionaries too—who died fighting the battle of health against disease. Here is the story of one of them—Dr. Arthur Jackson—who fought the plague on the borders of North China.

When Arthur Jackson was a merry boy at school, good both at games and at his books, he made up his mind to be a missionary. He went to Cambridge University, took his medical degree at Liverpool, where he studied also in the School of Tropical Medicine, and gained experience in general practice. Then he went to the Mission Hospital at Mukden in Manchuria to train Chinese medical students.

He was a big strong fellow some twenty-six years of age. His picture shows his regular features, his honest eyes, his firm mouth. He was full of fun and laughter, a man whose

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strength and purity bore witness to his Christian faith. He and the Chinese made friends at once. He began to learn their language. A life of splendid service as a medical missionary seemed opening before him. Then, as we have seen already, lung plague made its appearance in Mukden.

The old medical missionary, Dr. Christie, who had built up the fine hospital, was called in as advisor by the Chinese Viceroy. The young doctor, only two months out from home, offered to take charge of the work at the railway station, where trains going southward had to be stopped and the labourers kept back till they were free from fear of infection. In the depth of winter he had to find places where the men could stay. He had to sort out and separate all who seemed infected. Dressed in his white overall, his face and head covered by a mask and a hood, he moved among them, alert, kindly, resolute to save life. He slept in the railway station and used a railway carriage as his dispensary. "Many a poor labourer received the support of the doctor's arm as he was being removed to the hospital, and many a one died easier because Dr. Jackson arranged a pillow for his head"—so the railway inspector wrote.

Under the terrible strain of his work he remained cheerful and full of hope though he knew well the risk he ran. Now and then he took an hour or two to go among his friends, then he



DR. ARTHUR JACKSON

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was back to his labourers, talking to them in very broken Chinese, watching them, rejoicing when some passed on free from peril to their homes.

But one morning he did not turn up at work. The old doctor came to him at once. In a few hours signs of lung plague were clear. As long as he was conscious he thought only of the danger of those who nursed him. He begged them not to come near. In twenty-four hours he died—after ten weeks of missionary service in China.

Men who lived to fight the battle of health through long and arduous years did splendid things. What did Arthur Jackson succeed in doing in less than three months?

Let the Chinese, for whom he gave his life, answer. Here are sentences from Chinese newspapers written by men who did not profess to be Christians at all. “He did the will of God, to die for all. He came to China to be a teacher in the Medical College, but all that he had learned he offered up to save men. His work is not finished and his death will not destroy it.”

“Dr. Jackson has not died of plague, he died for duty. He is not truly dead.”

“His death in labouring for our country was actually carrying out the Christian principle of giving up one’s life to save the world.”

“Now he has given his only life for the lives of others we see he was a true Christian, who

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has done what Jesus did thousands of years ago.”

A week after Dr. Jackson's death a service



THE CHINESE RULER WHO LOVED DR. JACKSON

was held in his memory. At the end, the Chinese Viceroy, with his long beard and in his beautiful official robes, read an address which was sent

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throughout the world. He had the heart of a father towards those over whom he ruled and he deeply mourned the death of the noble young doctor who had come to help them. He said :
“ Our sorrow is beyond all measure ; our grief too deep for words.”

CHAPTER 8

THE DEADLY FLY: THE STORY OF A CENTRAL AFRICAN BATTLE

I

LONG ago in Europe there was a 'Thirty Years' War. This chapter tells of a war which has been waged in Africa for more than thirty years. It is the battle against Sleeping Sickness, that dread disease which threatens the welfare of the continent.

Here are two examples of its effects. In 1901 sleeping sickness was discovered in Uganda. It had swept eastward from the Congo where it had long been known. Within four or five years the tribes on the shores and islands of Lake Victoria suffered terribly. Kome, an island with 10,000 people, had barely one out of every twenty left. The fishermen on the lake shore were almost wiped out. Land that had been fertile became a wilderness. The shadow of death darkened the scene. At last the remaining population of the islands and lake shore were removed to healthier ground.

A tragedy almost as great is being acted to-day in West Africa, in the Cameroons. About

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100,000 living Africans are suffering from sleeping sickness there. One tribe has lost in a single year two out of every three of its members. At Ayos, in French Cameroon, where a splendid fight is going on under the French doctor, sixty-three out of every hundred people are infected. The doctors believe that in the early stages all patients can be cured ; in the second stages, six out of every ten ; in the later stages relief can be given, but cure is rare. An American visitor to the French hospital at Ayos tells how he saw long rows of men and women in the early stages of sleeping sickness, their prescriptions chalked upon their chests, waiting for treatment. Then he saw the pitiable people far gone in the disease. Nothing could be more miserable. They sat on benches outside the hospital continually falling forward in sleep. Some were large and heavy, some thin and wasted, like living skeletons. One woman tried to sit upright, fixing her eyes on the visitors with silent appeal. But her head sank lower and lower and at last with a gesture of despair she fell into a death-like sleep. Some dozen children, thin and weak and pitiful, tottered forward a few steps to meet the visitor and then sank on the ground. Among these sufferers—as in Uganda long years before—government officers and missionaries are working side by side.

The map at the end of this book shows how tremendous is the task. The dark lines marking

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where sleeping sickness has been found, cover vast areas of the Belgian Congo and push across the northern frontier into the Sudan. Southward and westward lie patches, larger or smaller, indicating centres of utmost danger even where at present cases are few. Note how the dark lines fringe some of the lakes and follow the courses of the rivers. It would be a good thing for a school to make a sleeping sickness map of Africa. Then, when the teacher had told the story which is written in this chapter, the school might consider how the whole population could band together to check the spread of infection and save for the next generation the white spaces on the map.

II

What causes sleeping sickness? The path towards a final answer was found down in Zululand. A young army doctor (afterwards Sir David Bruce) was sent in 1895 to find out why cattle and horses were dying of *nagana*. This disease was making great stretches of country unfit for use. No one could farm the land. Traders and hunters lost their horses and pack-mules when they tried to pass through certain districts.

Young Bruce and his wife settled on a healthy hill-top called Ubombe, in the midst of a green and juicy plain. On the hill-top all the animals

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were healthy, but if they went down into the plain they got nagana and sickened and died. Bruce examined drops of their blood through a microscope. He found it full of big active microbes. No healthy animal had these microbes in its blood. Every animal with nagana had them. Bruce had found the hidden foe which caused the dread disease. It is still known by his name.

One question was answered ; another remained. The disease was always attacking fresh animals—how did it get from one to another ? Some said it came from the air, others that the microbes were eaten when animals fed or drank in the plain. A story had long gone round that nagana was caused by the bite of the tse-tse fly which swarmed on the plain. Livingstone himself had caught some tse-tse flies and sent them home. They can still be seen in a bottle in London. Bruce, aided by his wife, made experiments. He found the nagana microbe in the fly. He caught a lot of tse-tse, brought them to the top of the hill and let them bite healthy horses. In about fifteen days the horses had nagana and died. The case against the tse-tse was proved. From that has started a ceaseless fight against nagana which still goes on in Africa. It is a great story, but cannot be told here.

A few years later a Sleeping Sickness Commission was sent to Uganda, where the disease was at its worst. The first members were Low, Castellani and Christy. Then Bruce came on the scene.

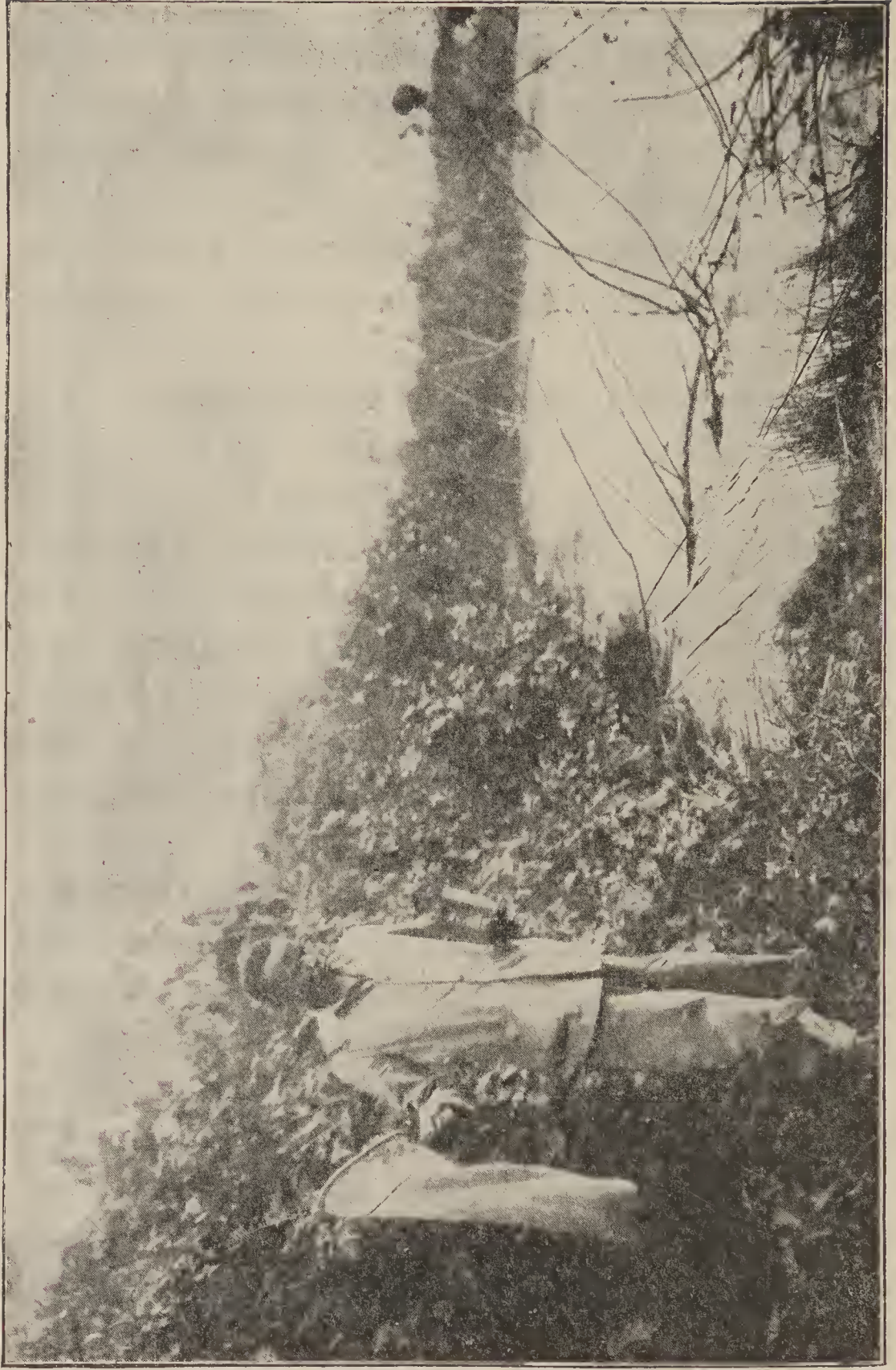
THE DEADLY FLY

Castellani found the nagana microbe, or one very like it, in those who had sleeping sickness. This gave the seekers a key to the problem. Bruce began at once to seek for the tse-tse fly, but the African Prime Minister of Uganda, Apolo Kagwa,* said there were none in Uganda. They had, he said, another biting fly called kivu. But the kivu proved to be the tse-tse under another name.

Stage by stage the whole story became clear. When a tse-tse fly bit someone with sleeping sickness it drank blood containing the microbes of the disease. These remained alive in the fly's body, sometimes for three months. When the fly bit again later it passed on the deadly microbe to man or woman or child. These in turn not only became cases of sleeping sickness, but carriers of it, for other flies bit them and then carried the infection further still. When an infected person went to a district where there was no sleeping sickness, the tse-tse flies, if there were any, bit him. Sooner or later sleeping sickness broke out, and made a new centre of disease.

David Bruce felt he must make a map for the tse-tse flies. He called Apolo Kagwa to help him. A great search was begun through the land. Baganda boys with butterfly nets (see the picture on the next page), were sent out to catch, kill and bring home tse-tse flies. There are hundreds

* His story is told in *Lives of Eminent Africans* (see Advertisement on page 179).



AFRICAN BOY CATCHING TSE-TSE FLIES

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of smart and active fly-boys at work in Africa to-day, but these were the very first. Bruce put a black mark on his big map wherever the tse-tse was found. He also put a red mark wherever sleeping sickness appeared. The black and the red marks were soon to be seen side by side. There was no sleeping sickness in places free from the tse-tse fly, but soon after the coming of the tse-tse, sleeping sickness appeared in place after place.

The shores and islands of the lake were infested with millions and millions of tse-tse, numbers of them conveying the microbe of sleeping sickness in their bite. It was impossible to catch them all. As the fly could not be kept from the people the people must be removed from the fly. Once more Bruce and Kagwa worked together, with the Governor, Sir Hesketh Bell. The survivors on the lake shores and islands were, as we have seen, removed with their goods to healthy new villages where the tse-tse was not found. The old huts near the lake were destroyed. The land was left to the tse-tse fly and the wild life of the bush. By degrees the flies lost their infection—though all the antelopes had first to be destroyed—and the people who had sleeping sickness died. After several years the centre of infection by the lake became quite healthy and by degrees the people were allowed to return.

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III

Sleeping sickness is a foe so deadly that all who love Africa combine to fight it down. Men of science and of goodwill in many nations are searching out the facts, testing new remedies, urging the various governments in Africa to work together to check the disease. Every government is now on the alert to keep sleeping sickness from spreading. There are large centres for research work, like that at Entebbe in Uganda and the Pasteur Institute at Brazzaville on the Congo. Hospitals, with their doctors and nurses and many able African assistants, are actively engaged in the war. America, France, Germany, as well as Belgium and England, have all shared in the toil and honour of finding remedies for the disease. Others are still being sought. The League of Nations at Geneva—the great court to which all world questions of burning interest are referred—has a Health Organisation which issues large reports and holds conferences of men and women with experience from every part of Africa. Sleeping sickness is one of their main concerns. They review the results of treatment and discuss the best lines of work. A body of men in America who have money in trust for the needs of the world (the Rockefeller Foundation), provide money for scientific study in the West and in Africa.

As this chapter was being written a very big

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book arrived from America. It was a report on the use of one great cure for sleeping sickness which is proving valuable in Africa. The book is by Dr. Louise Pearce, a woman doctor who has given years of her life to tireless research both in Africa among the sleeping sickness patients, and also in New York, where she is still bringing her knowledge and skill to bear on the dread disease. On my desk, beside her splendid volume, lies a packet of notes in her handwriting. One day in her office at the Rockefeller Institute for Medical Research she gave me an hour to talk about our little book, *Heroes of Health*, and wrote down some of what you have read in this chapter.

The Africans themselves are in the thick of the fight. One of them may easily find the rules which are applied in sleeping sickness districts very tiresome. He may dislike being examined and registered and treated for a disease which in its earlier stages does not trouble him much. Why cannot the authorities let him alone? But if he takes a steady look at the map at the end of this book and thinks of the future, he will accept for the welfare of others what he dislikes for himself.

In the large reports issued by the League of Nations, doctors from every part of Africa tell their plans for fighting the disease. They fall under three heads : the cure, or at least the care, of the sufferers ; steps to be taken in places where the disease has got hold ; the protection of places not infected as yet.

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Thousands of people with sleeping sickness have been cured by treatment. Remedies can be injected into the blood which kills the microbes. The treatment has to be continued for some time and the patient's blood needs to be examined from time to time lest the disease begins again. Cure is much less certain if the disease has gone far. Sometimes all that can be done is to give ease and shelter to the patients and keep them where they will not spread infection. This isolation from their friends is what tries the Africans most. There are many camps to which cases of sleeping sickness are sent. Plans are being tried in the Southern Sudan for treating the disease without separating patients from their friends.

In the centres of sleeping sickness marked on the map it is not enough to treat the sick, the cause of the disease must be boldly attacked. The flies live in the undergrowth of the forest or by the lake or river side. This calls for care and wise planning. Undergrowth has to be cut away all round the village and the land planted with crops which do not harbour the tse-tse. Watering places have to be freed from the green and juicy growth which would make shelter for the fly. Fishing has to be limited to places where the banks have been cleared. Men who go to the forest for honey frequently get sleeping sickness, so villagers are being taught to keep bees in hives on the clearing. Then honey can be had

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without running into dangerous forests among infected flies. Where sleeping sickness persists and increases, even in the face of such efforts to check it, the whole population of a village may, as in former years in Uganda, be moved to fly-free ground. This plan has saved the lives of many thousands. The new village without sleeping sickness is far happier than the old village where men, women and children were dying fast.

If people were like trees and stayed where they were planted, sleeping sickness would be a much less serious thing. But Africans, like all other people, want to move about. If a man has even the beginning of sleeping sickness he may start a new centre. The tse-tse flies in the place to which he goes bite him and become infected. Most of the small centres on the map can be traced to the coming of one man from a place where sleeping sickness was.

That is why men of science who gather in conferences, and the doctors who work on the field, all agree that in sleeping sickness regions the movements of people must be closely controlled. Every healthy person is given a card to show that he has been examined and is free from the disease. If he has been treated and cured he has another card to show. Frontiers between infected and uninfected countries are guarded lest sleeping sickness get among tribes who are free from it now. On the route between

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Uganda and the Sudan there is a belt some miles wide cleared of the undergrowth that is the home of the tse-tse fly. As the traveller enters one of these cleared belts in his motor, smart African fly-boys spring forward and search the car above and below, inside and out, lest even a single tse-tse fly should be resting on it and be carried into the uninfected country beyond.

The real danger of the fly and its deadly bite is new to many Africans, as the following story shows. When the study of sleeping sickness began in Uganda the men of science wanted a few flies. Willing helpers covered half a dozen bright little Baganda boys with sticky stuff and sent them to lie in the bush. They came home proudly with their bodies thick with flies, many tse-tse among them. The horrified doctors felt they had been spreading sleeping sickness instead of fighting it. The puzzled parents could not believe that flies would do their children any harm.

CHAPTER 9

HEALTH FOR A RACE: THE STORY OF BOOKER T. WASHINGTON AND HIS FRIENDS

I

THE little boy of Negro race who was born in a slave cabin in 1856—about ten years before the slaves in North America were set free—had certainly a long way to climb uphill. He did not know his father, he had no name except that his mother called him Booker. He had no chance of even learning to read.

His mother was the descendant of Africans who had been stolen from their own country and sold as slaves to work on the white plantations in the Southern States of North America. Some of the slave owners were not unkind, but the slaves had no rights and could be bought or sold in open market like cattle or sheep. The mother of this boy, afterwards to be known to all the world as Booker T. Washington, was a woman of character and purpose. In her miserable cabin life was hard, clothing was scanty, food was insufficient and poor. But she did her best for her children in a humble way.



MONUMENT TO BOOKER T. WASHINGTON

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There was a long and bitter war between the States in the North and those in the South before the slaves were freed. When the glorious day of liberty for which the slaves had longed and prayed came, it brought many sorrows in its train. The white landowners who were ruined by the war could not afford to educate their own sons and daughters or pay their former slaves to work for them. Thousands and thousands of Negro men, women and children, with no education and no experience, had to find a way to live.

As soon as the slaves were freed, little Booker had to earn money to feed himself and help his younger brothers and sisters. They were dreadfully poor. He was put to hard work, first in a salt-furnace and then in a coal mine, which he hated because it was dirty and horribly dark. All the time the boy was thirsting to learn to read. The first school for Negro children in that part of the country had just been opened. But Booker was earning money so he was obliged to stick to his work. He used to go to the salt-furnace very, very early ; then he hurried to school at breakfast time and worked at his lessons all day ; in the evening he went back to the salt-furnace again. Later on he had to work in the coal mine all day long and could only go to the night school in the evenings.

At last his mother, who pitied her little hard-working son, got him a place in the house of the mine owner. There he was trained in domestic

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work under a very strict mistress. But as she was just, he found he could satisfy her. He often found spare moments to learn more from his little store of books.

General Armstrong, a noble white American whose name should be written in letters of gold, was watching the Negro people in their struggle uphill. He determined that they should have a great school of their own where they could be trained to make their way in life. He believed that the Head, the Hand and the Heart must all be used. He asked for money and he got it. He gave his own life to the work. By the lovely waters of Chesapeake Bay he established the Hampton Institute, which is one of the finest educational centres in the world. Teachers of many races come to-day from Europe, Asia and Africa to see Hampton; the Negro men and women trained there have gone out to be leaders of their own people all through the United States.

Booker, now growing into a tall, active lad, heard of this new school. He did not know where Hampton was, but he meant to get there. He said good-bye to his mother and set out bravely as so many boys in Africa have done. He worked to earn a little money day by day to buy food, he slept wherever he could find a bit of shelter at night. At last the long five hundred miles lay behind him. He arrived, hungry, travel-stained, with no clothes but what he stood in, at the office of the school. Crowds were

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seeking to get in ; many had to be refused for lack of room. The dusty, weary boy who had brought no letter to recommend him was nearly sent away. But he stood and waited until at last the school official thought she would give him a chance. He was told to sweep out a large room and dust it. Now he did know how to sweep and dust. When his task was finished the school official took a clean white handkerchief, went into that room and tried to find some dust. There was none to be found. “ I think you will do to enter this school,” she said. “ I was one of the happiest souls on earth. The sweeping of that room was my entrance examination,” wrote Booker Washington in later years.

They wisely let him work to earn money to pay the school fees and buy books and clothes. He struggled hard and worked his way right up the school. He learned to love labour as well as books. He took an interest in the care and breeding of chickens and stock. “ The pig has always been my favourite animal,” he wrote.

General Armstrong watched the boy grow into manhood. He saw him teach a class well. He found he had influence over his fellow students. One day a letter came to say that a new school like Hampton was wanted down in the far south at a place called Tuskegee in the State of Alabama. Many Negroes there were longing to learn, but no teachers were at hand. It was a large and lonely task. General Armstrong, who never

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made a mistake in his opinion of a man, said that Booker T. Washington, then only twenty-five years of age, was the best of all the Hampton men to send. He was right.

II

Tuskegee to-day is very unlike what it was when young Booker Washington arrived there fifty years ago. He spent the first month in visiting the people he was to teach. Conditions were very bad. Whole families were crowded into a single room. Modesty and cleanliness were impossible. Garden plots of fertile land had no vegetables and the diet was very poor. Some Negroes who were earning money did not know how to spend it. In a house with a gaudy clock, or an organ which no one could play, Booker Washington found one fork to be shared by five people at meals. There were "plenty of hungry earnest souls who wanted to secure knowledge," but at times the desire was not on healthy lines. "One of the saddest things I saw during my month of travel," the young teacher wrote afterwards, "was a young man, who had attended some high school, sitting in a one-roomed cabin, with grease on his clothing, filth all round him and weeds in the yard and garden, engaged in studying a French grammar." Debt was common, most of the crops were sold before they were harvested and the money spent in

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advance. Here and there he found a little school in some tumble-down hut with four or five pupils learning their lesson out of one book.

Booker Washington opened a school in a room that let in the rain. Thirty pupils came ; in a month he had fifty. They wondered as they saw how their teacher used his hands in honest work—and was proud of it too. After a time he found a large old house with some outbuildings and good land round it, and was given money to buy it for the school. Farming became necessary, as his great family of students had to be fed. Money was needed to pay school fees, so simple workshops were opened and industries were begun. Foundations had to be dug for buildings ; after repeated failures beautiful bricks were made. At first the old buildings on the site had to be used. The stables made one classroom, the hen-house another. Booker Washington invited an old Negro living near to come and help him to clean it out. “ What you mean, boss ? ” asked the old man. “ You surely arn’t going to clean out the hen-house *in the day-time* ? ”

As he got wider knowledge, Booker Washington was sure that the only way to richer, fuller life for his people lay in improving the conditions of their health and their homes, and the better cultivation of their land. Eight out of every ten students came from country homes. Now and then a clever boy or girl might go to college or

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find work afterwards in the towns. But the bulk of the students needed to work in the field as well as in the classroom. "The first thing needed to make life effective for one's self or for society is to have a sound body." "There is as much dignity in tilling a field as in writing a poem." "The man who grows corn must remember that growing corn is not the end of life, but that the corn can be turned into the refinements and beauties of a civilised life and a Christian home." These are three sayings of Booker Washington's.

So the students added to their classroom work by putting up fine buildings, tilling broad and fertile fields and rearing plenty of well-bred stock. The fame of what was happening at Tuskegee spread far and wide. In its first fifty years three presidents of the United States of America visited the school. There is not a white person among the students, who now number over 2,000, nor among the staff, who number more than 250.

Booker Washington made Tuskegee a centre of health ; his influence is working still. Negro doctors and nurses live there and work in the country round. There is a health centre linked with the American Red Cross. The Memorial Hospital in the grounds has a good nursing school where Negro nurses are trained. At the gates is a great government hospital for coloured soldiers, built on ground given by Tuskegee, with an able Negro doctor at its head.

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Anxiety as to the health of his people filled Booker Washington's mind as years went by. The American Negroes were as a whole less healthy than the white population of the United States. A larger number of their babies died very young. Consumption and some other diseases were more common among them. It was easy to explain this, for the Negroes as a rule were poor, they were overcrowded in the cities and badly housed in the country ; they knew less than the white people about the laws of public health.

One day a great idea came to Booker Washington. Why should there not be a National Negro Health Week ? Then the whole body of American Negroes could be given teaching about health, and be banded together in active efforts to clean up their homes and the place in which they lived. This was the last great effort of this good man's life. He got the churches interested by asking for special sermons on health. He got bodies of Negro business men, teachers, farmers and others to join him in sending out an appeal. He got the newspapers to help. In his appeal he wrote : " Without health, and until we reduce the high death rate, it will be impossible for us to have permanent success in business, to get prosperity, to get education or to show other evidence of progress. Without health and long life all else fails. We must reduce our high death rate, dethrone disease,

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and enthrone health and long life. Let us make a strong, long, united pull together.”

That same year—1915—Booker Washington died. But, like the great school which he founded, the Health Week goes on and on. More than a million Negroes take part in it now. Local committees inspect the community and see what needs to be done, papers about health are sent round to every house, the school children are visited in their homes. When the Week comes round—it is always early in April, because April 5 was Booker Washington’s birthday—there is a general clean-up. The houses and yards are cleaned and all the rubbish is destroyed ; war is waged on the breeding places of mosquitos and on house flies and rats ; the school children help to clear up the gardens and waste ground ; wells are examined to make sure the water is pure ; the latrines are made sanitary ; teaching is given as to food, care of the sick, and especially the care of little children ; gardens are planted with vegetables and flowers ; trees are planted for the good of future generations. At the end of the week the committee goes round again to see that everything has been done. Sometimes a group of villages compete for a cup or prize offered for the best report of the Week.

Dr. Moton, who took Booker Washington’s place, has used the Health Week to draw the Negroes, the white people, and the Government

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together. Already the attitude of the Negro to disease and death has changed ; he plays his part bravely in the national battle for health. In the period since the Health Week was started the average life of the Negro in North America has increased from 35 to 45 years.

III

Like other great men, Booker Washington knew how to choose his friends and helpers aright. In the year 1899 a tall Negro lad with only a few small coins in his pocket arrived at Tuskegee. The doctor shook his head. The boy was ill and could not enter the school. " You all can't make me go away," said the boy. At last he was admitted to the school. He made his way right up class after class, paying for his board by work. While he went through the school course on agriculture he rose at two o'clock in the morning, milked fourteen cows before breakfast, went to day-school and milked the same number of cows in the afternoon. He finished the school course in 1906. To-day Thomas Monro Campbell—to give him his full name—is a powerful man, over six feet in height, with a kindly face and a ready smile.

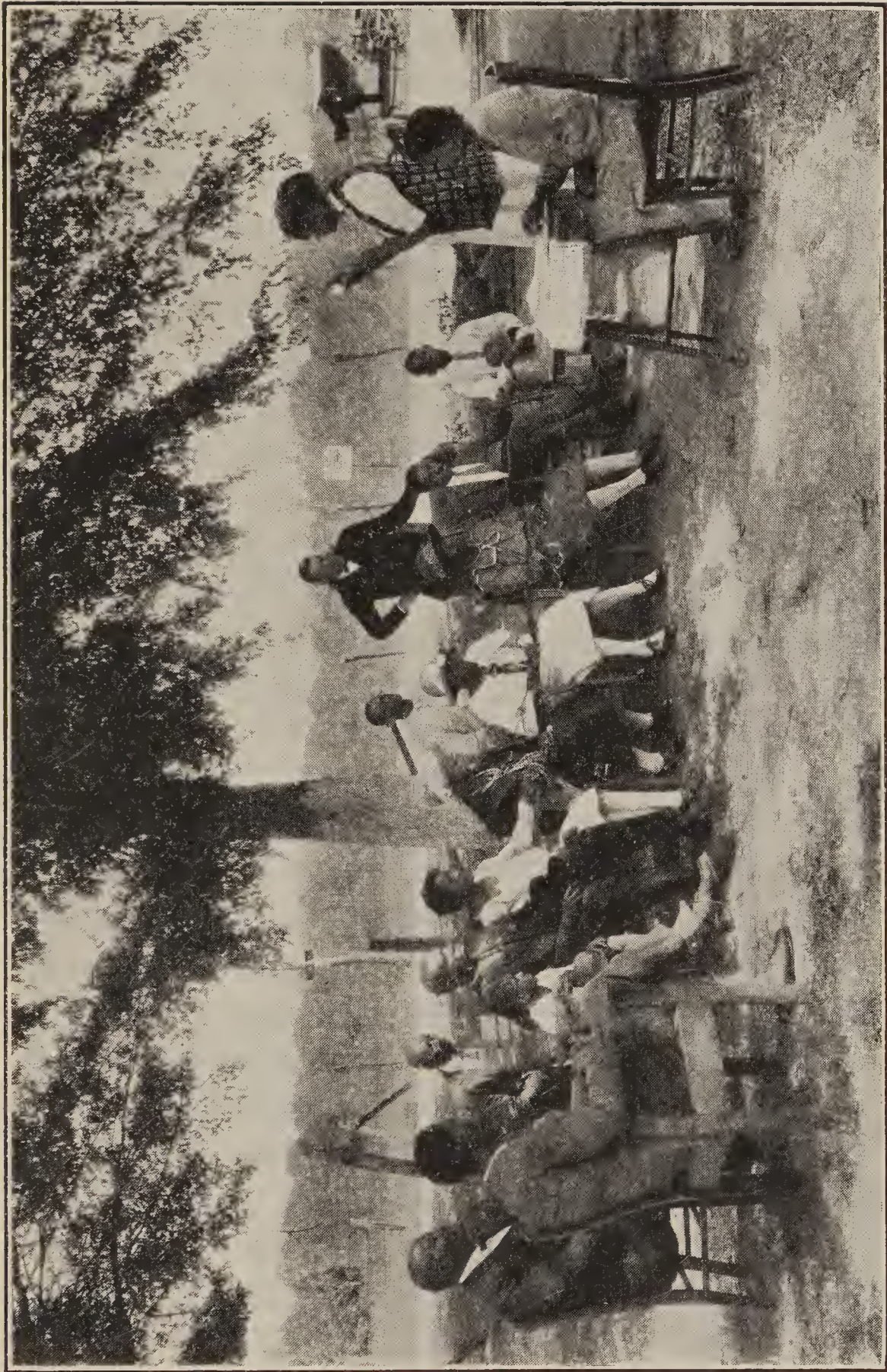
A few weeks after he finished his school work, Booker Washington chose him to begin a great task. The Negro farmers in touch with Tuskegee were prospering, but out in the district

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houses were still unhealthy, crops grown for food or for market did not yield good profit, chickens, pigs and cattle continued poor. Someone must go to the struggling farmers and teach them on their own ground. "The farmers who most need help are not getting it," said Booker Washington, "we must take it to their doors." He added an even wiser word: "Instead of telling the farmer to raise a better pig, raise the pig and he will never forget it."

So young Campbell at the call of Booker Washington began a work in which a staff of over 300 coloured men and women paid by the Government are now engaged. He himself is a field agent under the Government Department of Agriculture. He has a large staff of men and women working under him in seven of the Southern States. These simple Negro leaders, well chosen and carefully trained, are as really "Farmers' Friends" as was the great French man of science, Louis Pasteur.

They seek out in each district a farmer with an open mind who is willing to take one acre of his farm and try new methods on it. He is given advice about soil, seed, and cultivation and undertakes to carry out the plans. In a month or two the agent comes back to visit him. There is quite a stir that morning on the little farm. Neighbours are seen crossing the fields. The agent is as eager as if the farm were his own. The men pour out questions. He answers as



A LECTURE ON EGGS

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far as he can ; if he is puzzled he brings the answer the next time he comes. Many of the neighbours are copying the plans being tried on the special acre. When any crop is ready to gather they compare its quality and its quantity with that of former years. So they can judge for themselves whether the new ways are good.

While the farmers discuss crops and livestock with the man agent, a woman agent is having a busy time in the farmer's home. She knows how food may be better cooked and made more nourishing. She can show how to make the house more comfortable and the garden more fruitful. She can make useful things out of materials thrown aside as worthless. The women, like the men, gather from the neighbouring farms, for the woman agent talks so sensibly about the care of sick people and the value of fresh air, especially at night. She draws out news of the chicken clubs which the women and girls have started. Then, like the woman agent in the picture, she gives a lecture on eggs, how to get plenty of big ones and how to use them for food.

The farm-makers club for boys comes in for notice. There are numbers of these through the Southern States. A little group of boys band together and any profit they make is their own. If they form a pig club, each father gives his boy a little pig to rear and sell. If they prefer a corn club, each boy is given a plot to grow corn. Sometimes prizes are offered for

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the best crop of corn or the finest young pig. It is as good fun as a game of play, but it makes young farmers and it calls out enterprise and purpose in the boys.

Booker Washington also invented the Moveable School which some of Mr. Campbell's agents work. It is a fine roomy van or waggon which is taken by its own motor to a farm. The farmer and his wife welcome it. Notices of its coming are sent to all the farmers round. The workers on the van bring their own tools with them and sometimes even live-stock to show the difference good breeding makes. In an hour or two the van folk and the farm folk are hard at work together. The women get busy indoors. The outside of the farm is turned into a new place. The men mend broken fences, steps and gates ; a new chicken house is built, the path to the house door is tidied, the latrine is cleaned up or a new one made. The men are taught how to store roots, or prune trees, or choose seed for corn sowing. All the time questions are being asked and answered. At mid-day children cross the fields bringing food to their parents. Then the whole party stop work for half an hour and play some lively games for the good of their health.

IV

In the year 1895 Booker Washington had another great idea. He wanted the students to

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understand the soil, to plan crops wisely, to produce abundantly for market, family and stock. He felt that hard work in the field needed to be guided by knowledge, that science had a place in the homely toil of the farm. He wanted a man who could teach the students to put the strength of their minds behind their tasks. He heard of a young Negro who was teaching in another college ; he told him what was happening at Tuskegee and asked him to come and help. That day was one of the best Tuskegee ever saw.

George Washington Carver came with a story behind him not unlike that of Booker Washington himself. He was born of slave parents in a one-roomed house towards the close of the Civil War. He and his mother were stolen by some raiders ; the little boy was rescued by his former owner, but he never saw his mother again.

As a tiny child, clad in a single garment, he found his joy in the woods ; stones, flowers, insects, birds, beasts filled him with wonder, but there was no one to answer the questions he longed to ask. He thirsted intensely for education, but had only one old spelling book, which he learned almost by heart.

When he was ten years old he earned a little by summer work to pay for winter schooling. Step by step he got on, passing from one school to a better one. He found that laundry work—washing peoples' clothes—was a good way to earn his fees. Presently he ran a small laundry



PROFESSOR CARVER IN HIS LABORATORY

HEROES OF HEALTH

himself. He made many friends, but he let no one give him money ; he wished to pay his own way. At last he finished his school course, taking art, music and general subjects. Then he was invited to teach in a college. That was where Booker Washington found him and asked him to go to Tuskegee ; he has been there ever since.

At first he taught the science of agriculture, but by degrees he was set free to take a new line of his own. He found a way to get out of the soil and the food products of the Southern States treasures for man and beast. He found beautiful dyes of vivid colour in clays, and substances of value in wasted roots and stalks and skins. Most of all he found hundreds of uses for the common peanut and the yam or sweet potato. “ How did you come to begin ? ” someone asked him. He replied, “ I said, ‘ Great Creator, why did you make the peanut ? ’ and then I set to work and took the peanut to pieces.”

Though he began life so humbly, he is known throughout the United States and was made a Fellow of the Royal Society of Arts of Great Britain. In a great room—his laboratory—he may be found at Tuskegee, surrounded by jars and bottles, by shelves holding samples of roots and soils, and drawers full of papers and scientific calculations. Here and there are delicate sketches in inks of different shades. More than one large business firm has offered him a princely salary if he will go even for a few years to use for

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them his insight and skill. But his call came to him through Booker Washington long years ago, and he holds to it still.

“ I am working to fill the dinner pails of the farm workers,” he says. And then he takes his visitors round the laboratory to see the long rows of preparations made from the peanut and the sweet potato. In little paper-covered books he has printed hundreds of ways of cooking food to vary the meals of the workers, wise ways of preserving meat in hot weather, and information as to how better food may be grown for the cattle.

As he talks about peanuts and sweet potatoes he suddenly says some wise deep thing which makes you see that God is in all his thoughts. You pause to learn and listen. It is easy to understand why celebrated men and women come from distant lands and feel it an honour to meet him. This simple, joyous, childlike man, his dark face lit by eyes that burn with genius, is truly one of Tuskegee's contributions to the great ranks of Heroes of Health.

CHAPTER 10

THE STORY OF AN ISLAND SCHOOL

I

“THE colleges of Hampton and Tuskegee have much land, fine buildings, a large income and a strong staff. What they do is not possible in smaller schools.” So some visitors from Africa say. To enlighten them they are sent, as we were, to visit the Island School. In a long tour among centres of Negro life in the United States we looked forward eagerly to this visit. Why? First, because the island had strange and unusual beauty and a story full of romance. And second, because government officials and missionaries had found in the place “just what they wanted for Africa.” Dr. Aggrey, who loved to make links between Africa and North America, often spoke of this school.

At last we set off for Penn School, on St. Helena Island, off the coast of South Carolina. The journey had a spice of adventure, more like what we might expect in Africa than in the United States. We missed the train which should have connected with ours at Yemassee Junction—

THE STORY OF AN ISLAND SCHOOL

called after a tribe of warlike Indians who fought fierce battles there in the past. It was late in the afternoon and Beaufort, the small railway station near the island, was thirty miles away. The man who did transport for the railway at Yemassee was ill. There was no hotel, but the Negro porter, a smiling and enormously strong woman, offered to take us to her little home for the night. In the growing dusk we found a homely motor car which had brought someone to the train. Yes, the driver could take us to Beaufort if we did not mind driving very fast in the dark. He had to get back for a committee meeting, he said. We packed in, started; ran a mile or two on a well-made road, and then took to the bush—long stretches of the road being closed for repair. As we forced our way over broken ground with no light but our own uncertain lamps we were tossed up and down. But we drew up in Beaufort, having done our thirty miles, mostly across country, in a few minutes over an hour.

We had still some miles to travel in the soft moonless night. There was a long bridge, newly built, to be crossed to Lady's Island. A still longer causeway, lapped on each side by the high tide which broke in tiny white ripples beside us, brought us to St. Helena Island. We followed the little country road, turned in at a gateway, and, as our old motor horn sounded, a flood of light flashed on us through an opened doorway

HEROES OF HEALTH

—we were in Penn School at last. A party was just starting out to search for us in the dark.

Next day we made friends with the island and some of the island folk. We stepped from our door into a superb avenue of live oaks, spreading, evergreen, forest trees, from which hung streamers of Spanish moss like long locks of grey hair. Beyond in the dancing sunshine lay the broad stretches of the island, the undergrowth tinted with crimson and gold. Bright coloured birds flitted to and fro. The cotton fields lay bare after the gathering of the crop. Rough tracks crossed and recrossed the country. Long, blue arms of the sea pressed inward to meet the little rivers on their way to the coast.

Small houses were clustered here and there or hidden one by one in the woodland. Some of the houses were poor, almost falling to pieces, others were trim and well-kept with a pleasant air of home. Many had gardens gay with blossom. A great competition was on, for a director of education from Africa who visited the school had offered a prize for the best-kept flower garden. He was a very popular man.

All the long golden day we went to and fro, exploring the island, being welcomed in the homes, watching the happy intercourse between the two white women from the school and their Negro friends. Towards evening we drove homeward in the brave little school motor car which had carried us along rough tracks, under

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overhanging branches, and even right across country at times. There lay the simple attractive buildings of the school, not large or impressive like those of Hampton or Tuskegee, but beautiful in their fitness for the work they had to do, mainly home-made. The Principal's cottage, Hampton House, in the centre ; close by, the school with its pleasant classrooms ; the assembly hall where the islanders could meet ; the community house, with its library, where social activities were carried on ; the dormitories for a few boys and girls—not like the hundreds of the mainland schools ; the nurse's office and dispensary ; the sales house where clothing sent by friends was sold to the islanders ; the small, well-fitted workshops for various industries ; cottages for some of the Negro staff ; comfortable farm shelters for the stock.

But as we sat and thought that evening, a sense grew in our minds that Penn School did not consist of the buildings filled by teachers, boys and girls. The school, small and simple though it was, had taken the whole island as its classroom, and the friendly island folk as its charge. We were in a real Community School. The little school seeks to be a light in its own island and in the other sea islands it can reach. It is not larger than hundreds of schools in Africa. What it does, they can do ; indeed, some of them do it now.

HEROES OF HEALTH

II

Penn School, the first started for Negroes in the Southern States, began in the days when Booker Washington made his way to Hampton. The Negro community on the island was even worse off than those to whom he afterwards went at Tuskegee. The sea islands, once famous for the choicest kind of cotton, were left in poverty and isolation after the war which freed the slaves. There were few to help the people, they were too ignorant to help themselves. Two good white women went and lived among them for forty years. In 1862 they began Penn School.

Many years later—in 1904—a flood of new light came into St. Helena Island. A young white woman, named Rossa B. Cooley, took her degree in one of the finest women's universities in America, taught for seven years at Hampton Institute, and then brought to Penn School the new education which was quickening Negro life. She also brought with her Frances Butler, a friend as eager as herself. The island was full of fever; the friend, in the midst of all the first glad plans for work, caught it. Miles away from a doctor, with no medical supplies at hand, the battle of life and death was fought. The young Principal of the school, worn from nursing, alone with the tragedy which had come upon her, saw one day an old Negro woman sitting quietly on a pile of wood near the house. There was nothing

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that woman could say or do ; she knew what was happening and sat there to show that someone cared and was at hand. But on the eve of All Saints' Day—November the first—Frances Butler died. The brave battle for life was lost. “ It is all right. I'm so very glad we came here,” was one of the last things she said. It was a crushing blow. A few weeks later her place was taken by another friend, Grace Bigelow House. Ever since these two women have been at the heart of the island life. “ We ought to be thankful,” said Mrs. Juno Washington, one of the island folk, born in slavery, “ for God ain't leave us alone, but has sent two young doves to the Island.”

A fascinating story might be told of how one grade was added to another in the Penn School classrooms until high school and normal work rose naturally on the good foundations laid. But we are telling stories of health, not of general school work.

The island with its population of 6,000 Negroes and less than 100 white folk, was still full of primitive ways. Among the old people there were memories of the witch doctor ; then came the herb doctor who did some good and some terribly dangerous things with his drugs. Afterwards patent medicines were brought by an agent from house to house. They had wonderful titles and promised amazing cures ; but they did more harm than good. The simple people

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bought in faith. "On one of my visits," wrote Miss Cooley, "I found a long row of bottles sitting on the little shelf beside an old woman. She had never seen a doctor, but her son took care that his old mother did not lack medicine. She had drunk nearly £2 worth of it, the last kind was 'to cool the pain.' When she died all the bottles were taken to the grave—that is an Island custom."

Slowly ignorance waned when the gospel of health was taught in school and in the homes of the island. In school the children had hygiene classes, good hot lunches, and a share in vigorous health work. On questions of sex careful teaching was given to parents, boys and girls. There was no proper water in the school and few good wells on the island. The people had learned something, to use their own words, about "germs which get in the stomach and hatch there." So they were ready when great doings began. Trenches were dug—by Penn School girls; pipes were laid—by Penn School boys; farmer, carpenter, boys, girls and an expert from the mainland all worked together. The water tank was got into place. The drawing of water from a tap was as startling to the island people as the water Moses drew from the rock.

The people lived on poor, insufficient food. A pot of porridge first fed the elders, then the children scraped it out, and the dogs got what they could in the end. Green vegetables were

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thought to be only fit for cattle. A two days' old baby would be given sweet potato to eat. The hot lunch in the school became an educational force. The girls in the cooking class prepared it. The children, having walked long miles to school, ate it, and talked of it too. The cookery teachers visited the homes to show how vegetables could be grown and good food prepared. The school kitchen did as much good as the school books.

In the old slave days babies were of value to the masters, and midwives who knew something of their work were employed. In the years of poverty after freedom, knowledge grew very dim. To-day there are a fine body of Negro midwives on the island ; their centre is in the Nurse's office at the school. Some of them are known as " progressive midwives," for they keep on learning more each year. We found one smiling in the office, ready to show the neat bag nicely fitted up for her work. Each midwife has to attend twelve lectures in order to get a government certificate permitting her to work and charge a fixed fee. Their work is recognised by the State. They have chosen to wear neat blue dresses with white aprons and caps when at work.

III

The building up of health meant also the fighting of disease. Smallpox once drew near the school, like an enemy knocking at the gate.

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Years before a terrible outbreak had swept over the island. For long there had not been a case. But one morning a boy came to school with the rash. At once the doctor was called in to vaccinate the whole school. Begging letters came from mothers—"Not my child." But Nurse got out into the district and won the children to look on vaccination as a new kind of treat. They were soon to be found waiting outside her office asking, "Won't you vaccinate me to-day?"

Among the coast towns and in the islands, filaria—the disease which led Manson to his great discoveries in China *—was on the increase. A doctor came round to seek out the cause. As readers of Chapter 5 know, the tiny worm which causes the disease only moves about in the blood at night. So men and women, boys and girls were gathered in Penn School at nine o'clock one evening and drops of blood were taken from each, beginning with the Principal. Not one had a trace of the worm, so Penn School was proud of its health.

Far more serious was an outbreak of typhoid fever one summer time. Many sickened and some died. The fever was possible because health conditions were still wrong; the islanders were slow learners at best. The State Health Department sent a doctor to help. He went from house to house, teaching, explaining, winning love and respect from all. As the vaccina-

* Chapter 5.

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tion battle had been won, the families were glad to be inoculated against the fever. The main thing was to get the health conditions right. One plantation was chosen to make a sanitary district. A fine map showing every road and house was prepared, and a lot of little pins with red, yellow and blue heads. These were to be stuck into the map as they were won by each family. A red pin meant that the family had been inoculated, a yellow one stood for a good latrine or privy, a blue one for a proper well. Week by week the pin box grew empty and the map grew gay. At last there was only one undecorated house. The owner withstood all his neighbours. He said the fever was God's way of punishing people. If they stopped the fever He would punish more. Everyone talked to him, the doctor visited him ; at last he saw the truth. He stood, a penitent man, in the Principal's office at seven o'clock one morning to tell her he was sorry—would she let the doctor know? Soon his house too had earned the pins for the map.

Like the great institutions of Hampton and Tuskegee, Penn School has its health events. It shares in the National Health Week founded by Booker T. Washington. It has its farmer's fair and its baby day. Prizes for model homes put up by island workmen have been won in the National Better Home Campaign, a letter of approval being received from the President of the United States.

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So Penn School is lifting its community into true freedom as its sons and daughters find their place in the new day. Boys and girls pass now and then to the mainland for further education, but the island home calls some of them back. "Darling Jesus," prayed Mrs. Juno Washington in one of the school services, "please to bind us all together with a bandage of love." That is an answered prayer.

The dream of years came true when a Penn School boy with wider training came back to his island home. For the clever doctor, who is also one of the best farmers on the island, passed through Penn School, went to Howard University in Washington and qualified as a doctor there. He returned to St. Helena and built for his bride a charming home full of beauty and good taste. He is sought after by white patients as well as by those of his own race. He shares in all the community work.

It seems as if the little school on St. Helena Island works out in its smaller sphere what the bigger mainland schools are doing and what Heroes of Health have taught. It is like a drop of water reflecting the light of the great far-off sun.

Look back through the chapters you have been reading and see if this is true. As you do so, keep three questions in your mind. Think them over for yourself and talk them out with others. The questions are these :

1. *Is it possible that my home, my school, my*



THE ISLAND DOCTOR

HEROES OF HEALTH

community, could, like Penn School, reflect the work of great Heroes of Health? If the answer is "No," think out your reasons for it. If the answer is "Yes," consider how to begin.

2. How much would it cost in work and in discipline if I began to work on the lines of Penn School? Am I willing for this?

3. How could I get others to join in this battle of Health?

CHAPTER 11

THE STRONGHOLD OF HEALTH: A STORY OF FATHERS AND MOTHERS

IT is wonderful to watch a home grow. I have two pairs of friends in East Africa—one British by race, the other African—who married and set up home in the same year. In both homes two lively babies gladden the parents' hearts. Snapshots come to show how the babies grow. Letters from these African and British parents show that fathers and mothers of both races feel exactly alike. The old English song, "Home, sweet home," belongs to every land and race.

This book shows how much home life meant to men of science in the West—Pasteur, Manson, Walter Reed and William Gorgas among the rest. *Lives of Eminent Africans** is a picture gallery of happy homes. Bishop Crowther was stolen as a boy from a charming home; in later years he and his wife lived in friendship for half a century. Chief Khama, though his father's home was full of misery, had a home which was famous throughout the world. His wife, Ma-Bessie, was a true partner till she died. John

* See Advertisement on page 179.

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Tengo Jabavu had a splendid mother, a devoted wife, and children who do honour to his name. James Kwegyir Aggrey grew up in a rarely attractive home on the Gold Coast and set up one of equal attraction in the United States. Africa has its full share of worthy homes, though, like the West, it has homes in sharpest contrast. Think of the home life of Tshaka and of Mutesa, to take two instances known to all.

What makes a home? Not wealth or grandeur, for some of the happiest homes in the West and in Africa were at the outset very poor. People who love each other make a home. If they love each other wisely the home becomes a stronghold of health. Fathers and mothers—and school teachers too, as the previous chapters show—are Heroes of Health as much as the men of science who study disease, or as the doctors and nurses who try to cure it. When fathers and mothers live by the laws of health and train their boys and girls to keep them, half the sickness in the world will disappear. It is in the home that bodies are strengthened to resist disease so that boys and girls start out with a heritage of health. The home is the place where right habits are formed and where purity and self-discipline are taught.

African and English parents are second to none in love for their children. But they have much to learn as to the care of children's health. Mistakes have been made in former generations.

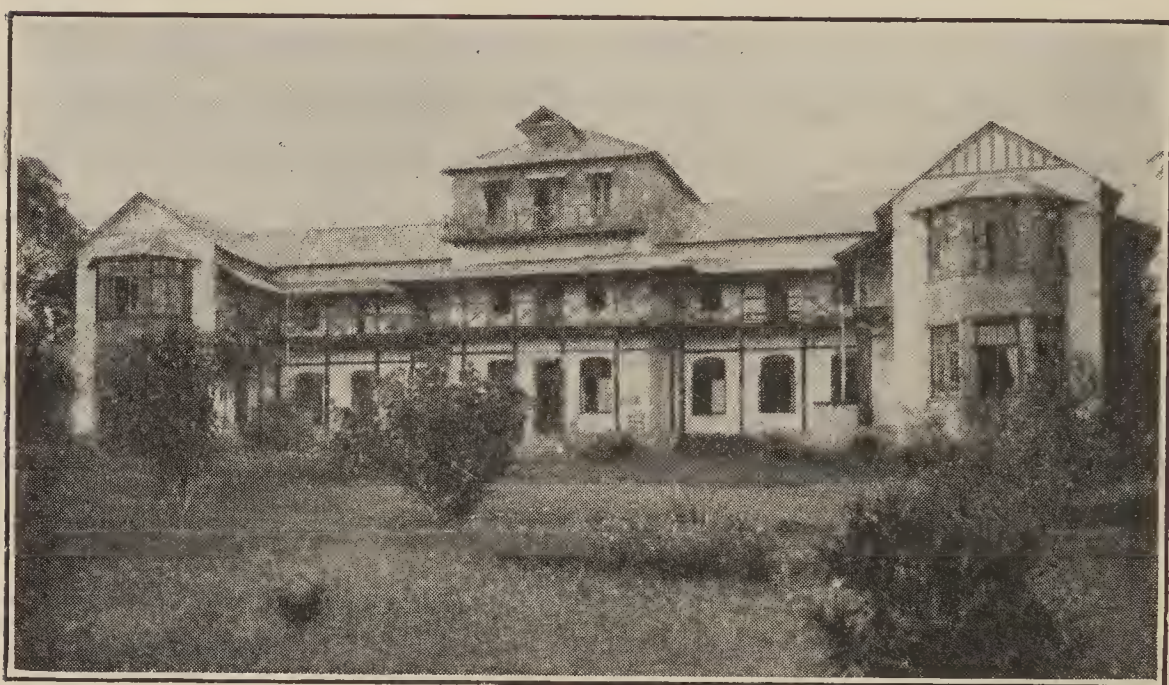
THE STRONGHOLD OF HEALTH

Welfare centres and baby clinics are now offering English mothers help ; children's teeth and eyes are being attended to ; books about health in the home are being eagerly read ; before girls marry they like to study mother-craft. Africa moves also in the direction of healthy homes. But child life is still being wasted. In England, out of every 1,000 children born, seventy-five die before they are one year old. In Africa some 400 out of every 1,000 are said to die before the same age. It is not that the black race is weaker than the white, nor that the climate of Africa is so deadly that infants cannot live, nor that so many diseases attack the African child. It is rather that in many parts of Africa the laws of health are still unknown. " When you see a mother stuffing thick porridge into the mouth of her baby, slinging it in a deer-skin and going thus to work in a hot sun, and then uncovering the child's perspiring body in a cool breeze—it is not that she lacks mother-love, it is sheer ignorance." So wrote a wise man who had lived for twenty years in a wild part of rural Africa.

But things move in the right direction now. Hospitals in Africa press towards the cure of disease. In child and infant welfare centres fathers and mothers are being taught how to keep their children in health—indeed, more than half the hospitals in Africa now do this double work. Young mothers come to be taught and helped in the months before their babies are born.

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Tiny babies are brought to be weighed, advice is given as to diet and cleanliness, the way to train them in good habits is becoming known. The babies love the nice milky food instead of porridge, they smile and grow fat. The young fathers and mothers are glad. In one home eight babies had been born and one after another had died. The ninth baby, born in a room at the clinic and



MATERNITY TRAINING CENTRE, MENGO

properly cared for from the first, lived and brought the joy of health to the childless home. In many a woman missionary's home this sort of work goes on and African girls trained by her carry their simple knowledge out into country homes.

It is not only village parents who need to learn the laws of health. Here is a story—true like all the others in this book—from one of the largest cities in South Africa. The plague of

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flies was worse than usual one summer. The houses in the Native quarter were buzzing with horrid, busy, dirt-loving flies. At the Children's Welfare Centre they tried a new plan. A small prize in money was offered for every tin of dead flies which the children brought in. A young American missionary undertook to weigh the



MENGO NURSES WELCOMING THREE GOVERNORS

corpses—it was not her favourite job!—and pay the promised fee. One day a small girl arrived weeping bitterly, with an empty tin. The missionary went to comfort her. Her mother—this was the story she sobbed out—would not let her catch flies in their room any more. Baby's eyes were very bad and mother said the flies were

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useful to eat off the yellow dirt. "Poor child," said the missionary, soothing the little girl. But she really meant "Poor mother," as she thought of the ignorant love that let infection be brought from the streaming eyes to the family food, and "Poor, poor baby," as she thought how likely it was that the precious sight of the bright little eyes would be lost.

One of the noblest health services in Africa to-day is that of the capable, winning young African women who, like their simpler sisters on St. Helena Island, are trained maternity nurses. African midwives of former years had experience and some knowledge, but it was mixed with magic and many ancient customs bad both for mother and child. The modern fully trained African midwives go out to give mothers at the time of childbirth care equal to that given to women in the West. From the Maternity Training Centre at Mengo, in Uganda, several country centres have branched out. Nearly a hundred maternity nurses have been trained, about thirty are now in training. Before these trained African women began to work in the districts, forty-eight out of every hundred babies were still-born. The death roll is now reduced to five per cent.

II

A battle can be fought, but a stronghold has to be built up, bit by bit. While men of science

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and their helpers are waging war against disease in Africa it falls to fathers and mothers to build up the stronghold of health in the home.

When a young African husband and wife set up life together they seldom have much money to spend. But the things that make homes healthy depend on knowledge, care and honest hard work rather than on wealth. Fresh air, sunshine, cleanliness and wholesome food bring health into the home. In Europe and America these things are not always kept in mind. You may still go down an English village street and find every window closed. There are one-roomed homes in English towns overcrowded and far from clean. White Americans have not all learned the secret of sweet, fresh homes and wholesome food. Among American Negroes there are many dark, ill-kept, dismal, windowless little dwellings, and also many well-kept simple homes like those near the Island School. Father and mother in their spare time keep the house in repair ; all their small possessions are in place and in good order. If the children come home from school as you sit with the mother and her baby on the shady verandah, they are sure to be healthy, bright and clean. In Africa the number of carefully tended homes like these increases every year. But there are still in the great continent many homes which are strongholds of disease rather than of health.

Here are the words of a man who loves the

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African and has given his life to bring health to the tribes. They suggest a splendid task which is waiting for young African home-makers to-day.

“ The African hut is about the most insanitary kind of dwelling you can possibly imagine. It is dark ; it has no fresh air in it ; the walls are of mud where every kind of insect can harbour, and there is a thatched roof where every kind of rat lives. We ourselves have taken sixty-five rats out of one roof after an outbreak of plague. The problem is to see that the Africans get better housing. The important thing is that they should build the better houses for themselves, and to persuade some Africans to build better houses is not a simple matter. You have to reach a point where they want better houses. For various reasons the majority do not want them yet. Here education comes in. Then you have to put the African in an economic position which allows him to buy certain things like hinges for doors and windows, and timber, which does not exist in some places. You have got to train men so that they have technical skill to do the building. All the forces that act on the African must be brought to bear on him so that he shall be persuaded to build sanitary houses.”

More in the women's sphere lie the questions of cleanliness and food. It does not matter whether the ways of the house are African or foreign ; whether the meals are eaten off a food

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mat on the floor or at a table set with knives and forks and plates. But it matters intensely for the health of the home—whether in Africa or the West—that the house and its contents should be clean. The parents fulfil their trust to the children by seeing that flies are kept away, both from the children and from food ; that mosquitos find no entrance ; that the children learn clean habits ; that dirty clothing never lies about ; that the whole household enjoys the chance of washing itself with soap and water every day. Dirt anywhere within a house drives out health and gives a foothold to disease.

The mother knows that food is also a friend or a foe to health. Every country differs in the diet its people like, but the bodies of the white races and of Africans need exactly the same kind of nourishment to keep them in health. A man is not well fed simply because his stomach is full. He needs a meal which will build up his body in all its parts. This is specially true about children's food, for the little bodies grow quickly and must have right materials with which to build.

In many parts of Africa food is scarce and there is little money with which to buy it. In the Belgian Congo, an official reports that the people are often hungry because they cannot get enough food. In parts of East Africa the whole population is apt to be underfed for some weeks before harvest. So the African house-

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wife has no easy task. But a wholesome diet costs no more than a bad one. There is no economy in using tinned imported food. Far better is the green produce of the garden and the ordinary foods which can be bought in the market—if they are fresh and clean. Wise African mothers see that when crops are sold enough is kept back for the household. Sometimes things which can be sold for money are never kept for family food. A weak man with sickly children and a few shillings in hand is a poor exchange for a vigorous father with healthy boys and girls about him, even if the coins in his possession are few. Good cooking is as important as good food to put into the pot. Many worm diseases follow on eating half-cooked meat. Digestive trouble is caused by partly cooked corn. On grounds of health as well as of economy the wisest Africans decline to drink Native beer or trade spirits, avoid the excessive use of snuff or tobacco, and never smoke hemp or other drugs.

There are certain old tribal customs which make a satisfying diet difficult in Africa. Some tribes scarcely taste meat, though they have large flocks and herds. In others milk is not drunk or eggs are not eaten. Certain animals are tabu to some tribes. The duiker was tabu in Khama's tribe. Khama's father would not set foot on a rug made of duiker skin, but Khama himself enjoyed a juicy duiker steak. Dr. Aggrey, a true

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lover of ancient tribal law, believed that food tabus ought to be allowed to die out.

Here is a story which shows how diet governs health. In Burma—see the map inside the cover—a disease called beri-beri is very common. It is known in parts of Africa too. It is not caused, like cholera, by impure water, nor by infection from mosquitos, rat fleas or tse-tse flies. People do not catch it from one another. It comes because their diet lacks something necessary for health. Burma is a great rice-growing country and the Burmese eat little but rice. It is the custom to polish the rice until all the little brown skin is rubbed off and only the white grain remains. But the nourishment necessary for the body happens to be in the little brown skin, and in the germ of the seed which is rubbed off with it. In Africa if labourers, or boys and girls in schools, are given more than half their ration in polished rice beri-beri appears. Other diseases such as pellagra—common in parts of the United States ; rickets—an infantile disease common in Europe ; and scurvy—which attacks those obliged to live on tinned foods—are also caused by lack of a well-balanced diet.

The housewife, in Africa and elsewhere, has a real place in fighting the battle of health.

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III

Home is the true stronghold against a group of the worst diseases which afflict Africa and many other lands. The organs of the human body which enable men and women to bear children are wonderfully made, and their good health is essential for the prosperity of the race. If these organs are misused or diseased healthy children are not born, men and women suffer sorely and become sources of danger to others. For these diseases are not passed on only by a man to a woman or by a woman to a man, they become infectious in many ways in ordinary life. In the early stages the diseases are hidden from sight and spread mischief before people are aware.

A great battle is being fought in Africa by government officials and missionaries against these diseases. It is part of the larger battle which is being fought against them throughout the world. In the early stages they can often be cured. This makes it important that those who have them should come to the places set up for their treatment. The future of Africa and of many other lands depends on the stamping out of these diseases. For they cause not only illness of the body, but bring moral weakness and lack of self-control.

As Africa learns the true relation of man and woman—a lesson the white races have also been slow to learn—homes will become disciplined

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and pure. Husbands and wives who respect each other, who are considerate and faithful in married life, will bring up their children wisely. From the earliest years good habits will be taught. As boys and girls grow older their parents will explain to them the laws of life and reproduction, as seen in plant and bird, in garden and forest. It is wholesome to learn like this.*

In African tribal life the need for teaching on questions of sex has always been recognised. It is given especially in the initiation ceremonies. But the teaching given is not always wise or pure. It exalts the man and debases the woman. It makes sex the centre of all things ; it tends to excite and inflame the minds of the young.

Great Africans have differed as to whether initiation schools are good or bad. Moshoeshoe believed in them, but was always present himself to supervise. Khama and his fine wife Ma-Bessie did not approve of them at all. No child of theirs passed through such a school. Dr. Aggrey, who loved to conserve all that was possible in tribal life, felt that many practices in initiation schools were cruel, especially in those for girls, and the teaching was sometimes not good on the moral side. He wanted to see full and careful teaching given to boys and girls by their own parents, and by the Christian elders of the village or tribe. He hoped that as the Christian Church grew stronger in Africa a way

* See Chapter 1.

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might be found to cast out the evils from the initiation school, and build up something which would help young parents in training their boys and girls. There are already some small beginnings of this.

Purity of mind, which lies behind purity of body, is not gained by hiding the facts of life or checking boys and girls when they ask questions, as is sometimes done in the West. Young minds need to be filled with a sense of the beauty of God's work as shown in the human body. "Male and female created He them. And God saw everything that He had made, and, behold, it was very good." * Purity can best be gained by teaching discipline of mind and body before the desires of adult life awake in boys and girls ; by teaching each to respect the other, the girl being given a place as a companion and friend. It springs up in homes where honour is paid by wife to husband, by husband to wife, where love is strong but marriage relations are controlled. The best safeguard for home purity lies in the example of the father and the mother.

There are also ways in which home and school can work together to help boys and girls to pure and disciplined life. One is by giving their active minds and bodies healthy interest and occupation. Something to look forward to, something to strive after, something done in common with others of the same age, makes for

* The first chapter of the Bible, verse 31.

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moral and for bodily health. English and American parents find games one of their best aids. They turn the thoughts of boys and girls to what is wholesome ; they give outlet for energies which might express themselves in unworthy desires and deeds.

Play is natural to most African children ; their games reflect the doings of their elders and are full of spirit and of fun. Some are very like the games of the West. The missionary who collected the rats' tails in Ngoniland was known for his love of games. When he camped in the evening village children would gather round his tent to play and dance. He sat in the door enjoying their laughter. The village mothers looked on, loving the fun but checking anything that was evil. After an hour of simple merriment, boys and girls playing or dancing now separately, now together, the soft night fell. Then the missionary talked to his playfellows about the pure and beautiful things in life ; he prayed with them ; they went off, happily tired, to sleep.

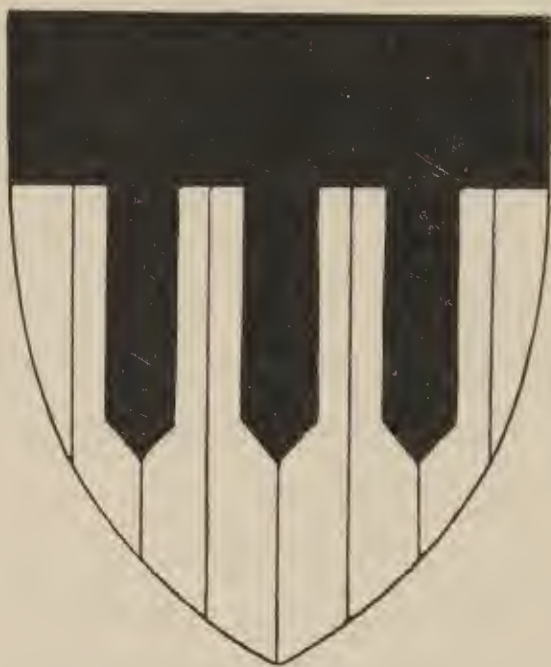
These home and village games lead on to team games in school and all the fine adventure of the Boy Scouts, the Wayfarers, and other agencies which guide the energies of the young into wholesome paths.

CHAPTER 12

THE COMMON TASK: THE MEANING OF THE ACHIMOTA SHIELD

I

THE strength of Dr. Aggrey, one of the greatest sons of Africa, lay in his belief in the Common Task. White races and black races could serve



THE SHIELD OF ACHIMOTA COLLEGE
(DR. AGGREY'S THOUGHT)

his beloved Africa, but they were at their best when they worked together. The design for the shield of Achimota College is founded on his famous saying that the harmony of music needed both the black and white notes on the piano. His whole life was spent in proving this.

If co-operation is needed anywhere it is needed in matters of health. Dr. Aggrey knew this. When he began work as a country minister among very poor Negro people he preached

THE COMMON TASK

“ about chickens, goats, something to eat, something to wear.” He got his people to sleep with open windows, to rear good chickens, to feed their children properly. “ If you knew how to cook you could change the world,” he said. He stirred them to build healthy houses and to enrich their land. In a few years health and prosperity triumphed. His church members had built fifty new houses and nineteen of them had motor cars.

The men of science whose stories are told in this book were all dependent on helpers whom they had trained. Many of these were Africans, Indians and Chinese. Thousands shared in the experiments made. In fighting great outbreaks of disease one wise man could lay plans which it took a whole community to work out. In dealing with disease calling for treatment week after week, month after month, half a dozen trained workers could serve thousands of patients—if the patients came regularly until they completed the cure. How could the spread of sleeping sickness be checked if people shirked inspection and slipped through the forest by-ways from an infected district to one that was free? A school teacher may give lessons in hygiene, but he is powerless unless fathers and mothers make health their common task in the home.

Men of science have often said plainly and sadly that it is easier to find a cure for disease than to win the co-operation of people in using it. Why is this? for all people love health. The

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answer is : Some do not believe that the good news of a possible cure is true. Some do not believe that there is danger of disease coming upon them. Some are slack and slow, caring only to do what their fathers did. Such men and women, whether old or young, are false to the best interests of their country, their tribe and themselves.

In the old days in Africa when war broke out every man followed his chief against the common foe. If lions threatened the village every man helped to drive them off. Disease is a more cruel foe than any of the old invaders, more deadly than wild beasts of the forest or the hills. There is a battle to be fought for health greater than any tribal war of the past. Large and small have a share in the common task. From the great Prime Minister Kagwa, who led in the war against sleeping sickness in Uganda, down to the school children who helped to check plague in Ngoni-land by collecting rats' tails, all are needed to help. One Hero of Health may be a young teacher who trains her girls in cleanly ways, in proper cooking of food, in merry active games ; another may be an African nurse who cares for mothers in childbirth and leaves behind her homes with healthy babies. Heroes too, as surely as were Pasteur, Manson, Gorgas and the rest, are parents who bring up boys and girls to be self-disciplined and pure, founders of happy homes in the future.

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It is right that governments should care about the health of Africans and see that every man has the chance of earning enough for his family. It is right that men of science should push on their study of the cause and cure of disease. It is right that Christian missions should maintain hospitals and welfare centres. It is right that all over Africa white teachers should explain the laws of health in colleges of various sorts, and in central schools. Agricultural training is needed for the good of soil and crops ; animal husbandry has to be taught and good stock imported to improve the Native breeds. But in the end it is true to say that the health of Africa depends upon the African. It is by his work that the battle will be lost or won.

The fine group of Africa's sons who are already qualified doctors or are studying for their degree ; the larger group who are trained hospital assistants or nurses ; the great body of those who take part already in the various health services—these are officers in the African battalion of the world-wide army of health. Supporting them are the growing number of enlightened Africans who are learning loyally to further every effort to repel disease and establish health.

These for the sake of home and country are building up an Africa able to develop its own resources for the good of the world.

HEROES OF HEALTH

II

Here are four stories from the United States, India and the Sudan which show heroes of health working at a common task.

THE STORY OF HAMPTONIAN PRINCESS

“ In a few minutes a princess is coming to see you.” We were at Hampton Institute, Virginia,



“ HAMPTONIAN PRINCESS ”

where Booker T. Washington was trained. A party of students of many nations had come from Columbia University in New York to see what

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the Negro college was doing for the health of crops and stock. One stirring record followed another, telling of increased food production, of thriving pigs and cattle.

There was a gentle rustling in the corner of the room. "Here is the princess," said one of the staff, as he lifted from a cosy basket a stately grey-brown hen. She mounted her perch with dignity, raising her head to give her guardian a loving peck on the cheek. She was a famous bird indeed ; she held the world's record for egg laying. Had not her descendants in the Hampton poultry farm raised the egg-laying average of the State of Virginia ?

But greater deeds were hers. Eighty young cockerels, sons of Hamptonian Princess, had been sold at a low price to Negro farmers round. In one little farm after another the breed of poultry was being improved, eggs were getting larger and more numerous, there was as a result better food and more money for the farmer and his family—all because the country-side gave itself to the common task of making use of one good bird.

Chances like this of using well-bred bulls, sheep, and pigs, and getting the eggs of well-bred poultry, begin to multiply in Africa.

THE STORY OF THE HOPPING LOCUSTS

News was suddenly brought to a large Indian Christian College that vast swarms of locusts had

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invaded the neighbourhood. Locusts had never been known to breed there before. Now in their millions they were hopping, hopping, hopping along, not having yet grown their wings. It was possible, by digging great pits and driving the young locusts into them, to destroy quantities of the insects and save some of the people's food supply.

The Principal stood before the students and asked for help to stay the plague. Eighty offered to go. The official in the district where the locusts were said it was all no use. "It is work too hard and too heart-breaking for your students," he said. "Out in the sun all day, hard at work digging, reasoning with villagers who will neither help themselves nor others, and who hinder those who attempt to work. It is the hardest thing I have come up against in India." "If I can find men who will stick to it, how many do you want?" asked the Principal. "Nine hundred by to-morrow," was the quick reply, "300 villages want three men each."

The Principal got to work, though 900 men was beyond his power. Three parties one after the other were sent, with stores and supplies. With splendid devotion a young Hindu member of the staff organised the whole plan. In a single afternoon one small party destroyed forty tons of locusts who were eating eighty tons of food a day. And that was part of only one swarm.

All too soon the remaining locusts found their

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wings and flew away. But the students had borne a noble part in the common task of the battle for health.

VILLAGE HEROES IN BENGAL

Lower Bengal in India has bad malaria in many districts. Villages are so full of it that houses are left unoccupied and land untilled. Most of the people have fever month after month. Some of the villagers found out that malaria could be checked. They knew the Government was too busy to help them so they decided to help themselves. They started a co-operative Anti-Malaria Society which has now more than a thousand village centres. Sir Malcolm Watson, who went to see the work of General Gorgas in Panama (see page 81), once visited these village centres in Lower Bengal. I have seen a map he brought home covered with tiny red dots to show where the Anti-Malaria Society is at work.

The villages formed committees and appointed officers of their own. Sometimes, though Bengal villagers are desperately poor, a group of villages managed to employ a health officer, paying him out of money given by themselves. Also some of them actually print reports of their work. One of these has pages and pages of names of all the people who have joined. Another is a very small report printed both in English and in Bengali. It tells of what

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one village of 700 people, joining with two neighbouring villages, has been able to do. In spite of poverty, sickness and many other difficulties these heroes of health got to work. Listen to the record of their deeds.

Great growths of unhealthy jungle, high enough to hide their houses from sight, were gradually cut away. The breeding places of mosquitos were cleared up and pools were treated with oil. Steps were taken to make a deep well to bring pure water within reach of the villagers. In the villages round, all the inhabitants were disabled by fever, but in the co-operating villages there was a marvellous difference in health.

“These successes,” writes the Indian vice-president and secretary of the village society, “have put new spirit into us. We cannot believe there is anything we cannot tackle. Already we are considering whether by working together we could make little model farms. We believe we shall be able to do it. We are a group of men with nothing belonging to us. We are inhabitants of a backward malaria-stricken village. But we believe that with resources available to the villagers malaria can surely be driven from this land of ours.”

A MODERN ST. FRANCIS

Not far from Omdurman in the Northern Sudan there is a leper colony. A missionary

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doctor visits it every week to give the treatment which is the leper's only hope of cure. Though the deep injection which has to be given in the arm is painful, the lepers welcome the skill that brings them hope. A young Christian African, himself a leper, is in charge of the colony. He rules and orders it well, and cares for the patients with wonderful love. They are cut off from their own people, but he has made the leper colony their home. He and the doctor work together in mutual trust.

Two English women on their way up the Nile to the Uganda Mission, were brought by the doctor in his car when he visited the colony one day. They expected to find a place full of sorrow and pain. They moved about among the lepers while the doctor heard the report of the last week's work. Disease had left terrible marks upon the inmates, but there were signs of happiness too. Into their lives peace and beauty had been brought. When the doctor joined them his face shone with joy at something which had occurred. Before the party left the young African in charge gathered the lepers together and told them why their lady visitors were travelling to the south. The whole company knelt while he asked God to bless them and to prosper the great Church in Uganda to which they went. The lepers as they prayed held out poor maimed hands to receive God's blessing for their friends.

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On the way back to Omdurman the doctor told his guests what had moved him. The head of the colony had brought him an earnest request. He knew that his only hope of being restored to health and to ordinary life lay in regular treatment week by week. Like the other lepers he clung with eagerness to this. But when his arm was very sore he could do little for those under his care. They too suffered and he wanted to give them help. So he asked that his own treatment might be stopped that he might give more service to them. It was the spirit of sacrifice which moves the true hero of health. For one week the doctor let him miss his treatment that he might feel his offer was accepted. Then he was told it must go on again. A man so Christ-like in spirit was needed for the sake of Africa. More than ever the doctor wanted to use his skill to bring him back to health.

III

Centuries ago a great mountain in Italy poured out volumes of smoke and fire. Red hot lava came through an opening in its side and flowed like a stream of death through cornfield, vineyard, and village street. Two cities were buried beneath its flood. Destruction came so suddenly that life was fixed just as it went on every day. The lava filled the houses ; then it cooled and turned to stone.

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Long afterwards men began to dig out the lava from the cities. The traveller in Italy can see to-day just what the people were doing when it came. Bread, long since turned to stone, was found in the ovens. There were the clothes and the ornaments the people used to wear. Bodies were found too of those who had been caught in the lava stream. In one house the workers came upon the body of a little child, its tiny arms stretched out. They said, "The mother must be over there. We shall find her if we go in the direction of those arms." And they did. The child's appeal for help showed where the mother lay.

That story helps us to understand why men have always linked health and religion together. They are stretching out their arms for help. In Chapter I we saw that God the Creator meant His world to be full of health, and that when Jesus Christ came to show what God was like, He healed all manner of disease and gave men abundant life. So it is a true instinct which leads men everywhere to turn towards God. The Christian Church began at once to pray for the sick and has done so ever since.

There are two false ideas which hinder men from giving religion its rightful place in the common task of bringing health to men. One is the idea that God sends disease to punish men when He is angry. This is common in Africa to-day. It was believed in the days of Moses

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and in the days of Jesus Christ. “ Who did sin, this man or his parents, that he was born blind ? ” the people asked. But Jesus rebuked their thought. Disease comes to men when the laws of health are broken by others or by themselves. Sometimes no way to cure it can be found ; then God is ready to give men courage and patience to bear their pain, making His strength perfect in their weakness. But disease is an evil to be fought against and the laws of health have to be honoured as God’s best gifts to men.

The other false idea is that because Jesus Christ healed disease without remedies it is wrong to use them now. There are people to-day in America, in Europe and in several parts of Africa who believe this. They think that faith in God is not real if any treatment of disease is welcomed or if any medicine is given to the sick. In some places groups of such people have broken away from the Christian Church and set up religious bodies of their own.

The stories told in this book show the mistake of this and point to the true way of health. God working in His world for the building up of health guides the men of science as they search out the secrets of disease. The remedies which they find are meant by Him for the use of mankind. A great French doctor said hundreds of years ago, “ I use the remedies, God works the cure.” The laws of health are not made by men ; they are discovered as they study the world.

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Obedience to laws and the use of remedies brings men nearer to God. Faith which uses the means He has given, and the knowledge He has revealed, is as real as that which brought sudden healing when Jesus Christ laid hands upon the sick.

Here, in the chapters of this book, are set forth the battles of health against disease, of cleanliness against dirt, of discipline and self-control against impurity, of racial welfare against racial decay. The task is common to black and white in Africa and elsewhere. More than that, it is a task man shares with God.



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